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**A NATURALIZED PHILOSOPHY FOR RESEARCH INTO THE
ADMINISTRATION OF EDUCATIONAL ORGANIZATIONS**

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ABSTRACT

A NATURALIZED PHILOSOPHY FOR RESEARCH INTO THE ADMINISTRATION OF EDUCATIONAL ORGANIZATIONS

After setting out in detail the social-historical context of the theory debate in educational administration and the philosophical elements of the four traditions of inquiry in this field (logical positivism, phenomenology, critical theory, naturalism) along with a consideration of the emerging lines of criticism against naturalism, the central thrust of the thesis is to set out the main features of a naturalized philosophy upon which research into the administration of educational organizations could be based. The notion of naturalized philosophy is discussed, followed by a working out of a naturalized account of the basic ontological, epistemological and axiological assumptions. What is attempted is the construction of a systematic philosophy which seeks to unify these primary branches into a coherent whole tied together by the principles of naturalism. The implications of naturalized philosophy for research into the administration of educational organizations is also examined.

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INTRODUCTION

THE PROBLEM AND ITS SETTING

Since the early 1950s, the administration of educational organizations has joined other branches of educational practice as an international field of academic study. What began in the United States has since spread throughout the English-speaking world and is now to be found in Australia, Canada, New Zealand, the United Kingdom and many other Commonwealth countries. University departments established professional degree programmes; in the United States alone some 400 institutions offer masterate and doctoral degrees in educational administration with over 2500 academic staff. A multitude of societies and organizations have been formed to promote the study and practice of educational administration: the University Council for Educational Administration and the National Conference of Professors of Educational Administration are prominent in the United States while the Commonwealth Council for Educational Administration provides an umbrella for national organizations such as the New Zealand Educational Administration Society. Furthermore, specialist journals were established; the older and more prestigious publications include *Educational Administration Quarterly* (USA), *Journal of Educational Administration* (Australia) and *Educational Management and Administration* (UK). More recently the *New Zealand Journal of Educational Administration* has appeared.

While the consequent literature to be found in books and journals has increased dramatically on a wide range of topics, few issues have generated more controversy than the theoretical assumptions of educational administration. At the very heart of the 'theory debate' as it has come to be called, is a set of philosophical problems central to the establishment of what constitutes the proper study of the field. Put simply, the problems are three-fold: the first is ontological - what is there, or more precisely, of what does the world consist? This leads to puzzlement about what educational organizations are and the nature of human behaviour. The second is epistemological -

what is the structure of our knowledge of the world and how is our knowledge of educational organizations acquired? The third is axiological - what connection holds between matters of fact and of value and how does this govern human behaviour in administrative contexts?

The views which have been expressed on such weighty philosophical topics as these tend to fall into four broad traditions of thought, a classification consistent with the groupings of perspectives in other areas of educational inquiry and the social sciences in general'. The first to emerge was logical positivism in the early 1950s. Some twenty years later a phenomenological alternative took shape, followed in the 1980s with the injection of critical theory into the debate. The 1990s has witnessed the appearance of a fourth major contender, that of naturalism. There are now the glimmerings of a fifth; postmodernism. Each tradition has sought to establish a body of philosophical principles, in conflict with the others, to govern research into the administration of educational organizations.

To a considerable extent, the development of each school of thought has been relatively uneven. In the twenty or so years from the early 1950s onwards, logical positivism flourished in educational administration, largely unchallenged and supported by the general academic and public acceptance of a climate shaped by the success of empirical natural science. Indeed, as Giroux² has noted, educational inquiry was nurtured in a 'culture of positivism' - the tenets of positivism were widely disseminated and received extensive backing. The connections between logical positivism and a science of educational administration became firmly established and were well worked through so that today few in this field can be ignorant of the positivist tendencies in educational administration.

The phenomenological alternative which developed in the 1970s was itself firmly located in an established tradition of philosophical and social thought, and through a period of intense debate was well able to establish its intellectual credentials. By being exposed to severely critical scrutiny from positivist opponents, the advocates of phenomenology in educational administration were able to engage in extended dialogue and ensure that their philosophical position received widespread attention. Like its adversary, phenomenology has been well worked through even if it gathered fewer adherents than positivism did.

Phenomenological thought captured the social sciences and education in the 1970s, but a decade later its influence began to wane in favour of critical theory. For some, the limitations of logical positivism and phenomenology were transcended by the broad compass of a critical theory approach to inquiry, and, as with the wider social sciences, critical theory gained a strong foothold in the study of educational administration.

Whereas these three traditions of intellectual accomplishment in educational administration have been well grounded in extensively developed schools of philosophical thought which have relatively well-established and coherently structured histories, this is not the case with the fourth tradition, that of naturalism. The development of naturalism as a viable alternative has been hindered by several distinct problems. It is the most recent and so has had less time to establish its philosophical base; it is up against three well-established competitors which, comparatively speaking, have had more opportunity to mature and attract allegiances; and its philosophical grounding is more diverse but more importantly many of the central philosophical concepts and theoretical assumptions are still at an early stage of being developed as a coherent whole. Or, to put the point differently, while logical positivism, phenomenology and critical theory in educational administration have relatively settled philosophical traditions to call upon, this is not the case with naturalism. Rather, the work in educational administration is but a step or two behind the still evolving and advancing research in philosophy.

One of the central issues in the theory debate in educational administration revolves around the question of whether a science of administration is possible. Those in the theory movement thought that by adopting the principles of logical positivism a science of administration could be developed suitable for educational organizations. Such a science was characterized by observation being epistemically foundational, the is-ought distinction being employed to licence the separation of science and values, and empiricism served to narrow down knowledge to the empirically verifiable.

It is against this account of science that the postpositivist alternatives have evolved in educational administration. The phenomenological, critical theory and naturalist traditions are all in agreement that the positivist story should be rejected. What should stand in its place is, however, far more problematic. Phenomenology and

critical theory accept the positivist argument that epistemology must be foundational while denying that observation provides such a foundation. Instead, for phenomenologists the indubitable base lies in the participants' meanings, interpretations or subjective states; for critical theorists three cognitive interests (technical, practical, emancipatory) ground our knowledge. On the fact-value relation, critical theorists and some phenomenologists are in agreement that the distinction should be retained. The partitioning of cognitive interests into three leads to critical theorists splitting off science as empirical/analytic knowledge and values as hermeneutic and emancipatory knowledge. The dualism is also accepted by some sympathetic to phenomenology such as Hodgkinson, but not by others, including Greenfield, who argue that facts and values are intertwined. The empiricism of positivist science was handled in several ways. For the phenomenologists, empiricism was an anathema, to be replaced by interpretive inquiry. Thus, one limited epistemology was ousted and replaced by another similarly narrow theory of knowledge. Critical theorists, on the other hand, while accepting that the empiricist and interpretive epistemologies are complementary and necessary if full epistemic coverage is to be achieved, felt compelled nonetheless to regard them as logically distinct forms of knowledge. So, phenomenology achieved epistemic wholeness but like positivism paid a high price for it since each position eliminates the mutually exclusive opposite of itself to do so. Critical theory, conversely, forewent unity in the interests of epistemic completeness. The consequence of these moves against logical positivist theory, by either rejecting it for interpretation or including a version of it in a wider epistemic scheme of critical theory, is to limit science to the realm of the natural world, thereby quarantining it from the social domain where its application is deemed to be entirely inappropriate. Thus, the possibility of a science of administration for educational organizations is denied. But need it be?

Two commentators have recently put the issue this way: Better science or alternatives to science?³ Phenomenologists and critical theorists have rightly criticized and rejected the logical positivism of the theory movement. However, by equating a logical positivist account of science with science itself rather than seeing it as only one conception of science, the opponents of the theory movement's science of administration fail to recognize that disposing of the logical positivist version of science

does not lead to the conclusion that a science of administration is impossible. There are a number of nonpositivist accounts of science which could be considered, and should be considered, prior to rejecting science for some alternative to science.

The aim of this thesis is to present in detail one such nonpositivist account of science which is not only an improvement on the logical positivism of the theory movement in educational administration research but is also capable of incorporating the valuable insights of the nonscience alternatives into the research process while eschewing their limitations. It is a broader and more comprehensive account of science. The quest, then, is for a better science rather than another alternative to science.

Although the theory debate in educational administration has ranged over a wide territory, the focus of this thesis is on one particular aspect of the broader picture, namely, research into the administration of educational organizations.⁴ While a considerable body of literature has been generated on this topic, at least concerning logical positivism, phenomenology and critical theory, much less has been written from within a naturalist vein. Those committed to naturalism in educational administration have tended to devote more of their energies to developing critiques of the rival traditions, until very recently paying little attention to systematically setting out a version of naturalism to underpin an adequate conception of educational administration research. This thesis is an attempt to fill the gap.

There have been a number of histories written about the broad philosophical developments which have taken place in the period 1950-1995. Of them, Willower⁵ has made a telling point: the recording of the changes in thought from naive empiricism, through logical positivism, phenomenology, critical theory to naturalism, while placing great weight on the epistemic differences of the competing philosophical traditions, fails to locate these adequately within a social-political context. The developments which took place did so not in isolation but in conjunction with, or in the wake of, similar sorts of shifts of view in the social sciences and philosophy. But not only this, the changes wrought in thinking about research in educational administration have to be located in the material conditions of their times: logical positivism and the science of administration with the public recognition of the achievements of science in the 1950s and 1960s; the phenomenological with the growing disenchantment with science, and

the radical social protests and upheavals in the 1960s and 1970s; critical theory seems to be more aligned with feelings of alienation due to the excesses of capitalism; and naturalism with attempts to restore some social cohesion and unity following such widescale social conflict; and even more recently, an emerging postmodernism linked to the increasing repudiation of the modernist world.

Willower goes on to make the point that in the analyses of the various philosophical positions in educational administration research there has been a too-heavy reliance on the writings of a few seminal writers (eg. Greenfield and Griffiths) which seems to attribute far more to them than is warranted. Rather, each of the philosophical traditions not only draws off a rich background of theoretical literature, but just as importantly the emergent traditions in educational administration are the combined work of many rather than just a few. Accordingly, it is a mistake to limit the accounts offered of each tradition simply by setting out the ideas of one or two 'great men' such as Griffiths and Greenfield.

Finally, as several commentators have remarked, the histories and critiques of the competing philosophical traditions are often less than adequate. In recent critiques of Evers and Lakomski's *Knowing Educational Administration: Contemporary Methodological Controversies in Educational Administration Research*⁶, three reviewers point to deficiencies in this area: Willower⁷ states that their account of the theory movement, its thought and research "leaves something to be desired"; Gronn and Ribbins⁸ claim that the authors' analysis of Greenfield's stance is "based upon a partial examination of his writings and a selective treatment of his ideas" and conclude that the discussion of Greenfield is "in many respects, unsatisfactory"; Bates⁹ suggests that their critique of critical theory "makes only brief reference to Foster's development of critical theory in educational administration and which completely ignores any contextual analysis of my work which they claim to be central to the critical theory tradition of educational administration." He goes on to note that by examining the original writings of Habermas rather than his later reformulations, they avoid discussing the social-political grounding of critical educational administration theorist's interest in Habermas, and by ignoring the reading of critical theory given to it by writers in educational administration, there is a tendency to ignore how this and other traditions had to be reworked to suit the particular conditions of educational administration, for

"such applications are an important and often creative undertaking."¹⁰

Given these complaints, there is a requirement that any account which traces out the history of the philosophical traditions of educational administration research and examines their nature should pay heed to these charges. Accordingly, in what follows, the social-political context of the matter is closely documented, at least insofar as the educational and social science contexts are concerned. Only minimal attention is given to the wider social background. In tackling the various philosophical traditions, the focus is not fully on the 'great men' altogether, although their contributions cannot be avoided. What is attempted is the weaving together of various intra-theoretical views to present a more comprehensive and holistic account even if this is at the expense of a little conceptual tightness. After all, the development of a philosophical tradition rests on the endeavours of many rather than the few and their varying contributions to the whole should be recognized. And lastly, to quieten the grumblings of the aggrieved, a determined effort has been made to provide a faithful and accurate presentation of the views of the participants in the philosophical debate. Now, they may not give their affirmation to everything encompassed within the tradition of which they are representatives, but it is not an unreasonable expectation that what is attributed to them would nonetheless obtain their assent.

After setting out in detail the social-historical context and the philosophical elements of the four traditions of thought in educational administration, along with consideration of the emergent lines of criticism against naturalized philosophy, the central task of the thesis is to set out the main features and basic configuration of a naturalized philosophy and then explore some of the implications of a naturalized philosophy for research into the administration of educational organizations.

The structure of the thesis divides into two major sections. The first, contained in the first five chapters, is largely descriptive. The social-political context of the 'theory debate' and theorizing about the philosophical assumptions of research in educational administration is considered as a preliminary to the more substantial detailing of the central traits of logical positivism, phenomenology, critical theory and naturalism.

The second section is primarily philosophical; in chapters six through ten the notion of naturalized philosophy is discussed, followed by a working out of a naturalized account of ontology, epistemology and axiology. What is attempted here is the

construction of a systematic philosophy which seeks to unify these primary branches of philosophy into a coherent whole held together by the principles of naturalism. The philosophical ideas of Quine and the Churchland's¹¹ are employed to achieve this.

Finally, in chapter eleven the implications of a naturalized philosophical system are examined for their relevance to research into the administration of educational organizations. The philosophical position advanced is internally coherent, offers a plausible account of the structure of research, and provides a viable and worthy alternative to its rivals. Whether it will come to be the preferred philosophical position in educational administration research remains to be seen.

NOTES

- 1 The four-fold classification of the philosophical traditions in educational administration originally adopted for this thesis has since become more explicitly recognized by others. For example, in a discussion of ethics and educational administration Evers (1990b) draws distinctions between traditional science of administration, Greenfield's subjectivism, critical theory and pragmatism. Willower (1992b) employs a similar set of categories. In their respective books, Evers and Lakomski (1991) and Greenfield and Ribbins (1993) also employ the same conceptual arrangement. The same order is also to be found in other branches of educational inquiry - sociology of education (Blackledge & Hunt, 1985) and educational research (Bredo & Feinberg, 1982; Carr & Kemmis, 1986; Robinson, 1993; Soltis, 1984) - as well as in the philosophy of the social sciences (Bernstein, 1976; Fay, 1975).

- 2 Giroux, 1979.

- 3 Gronn & Ribbins, 1993.

- 4 The phrase 'research into the administration of educational organizations' requires some clarification. The term 'research' is taken to be epistemologically equivalent to other such notions as 'the study of', 'inquiry into' and 'investigation into'. There is nothing special about the word 'research' except that it is perhaps the most widely used term.

The phrase 'the administration of educational organizations' has been chosen in preference to 'educational administration'. The latter is a rather more general expression used to cover all manner of administrative matters in education including personnel management, resource allocation and the like. The specific focus of this thesis is on educational organizations as particular social entities, especially their administration. This concentration on a particular element of the wider picture permits a greater in-depth analysis of a central feature of educational administration theory and practice.

- 5 Willower, 1993, 155-6.

- 6 Evers & Lakomski, 1991.

- 7 Willower, 1993, 156-7.

- 8 Gronn & Ribbins, 1993, 163-4.

- 9 Bates, 1993, 175.

- 10 Willower, 1993, 156.

- 11 The extensive writings of Quine and the Churchlands, as listed in the References, were used to underpin a naturalized philosophy. Just prior to

submission of the thesis Quine's (1995) latest book, *From Stimulus to Science* was published, as was McCauley's (1996) *The Churchlands and Their Critics*. Their appearance was too late for consideration - while both books will probably offer new insights it is unlikely that they would have led to any significant revision to the argument developed in this thesis if they had been available earlier.

CHAPTER ONE

THE SOCIAL-POLITICAL CONTEXT OF DISCOURSE ABOUT THE PHILOSOPHICAL ASSUMPTIONS OF RESEARCH INTO EDUCATIONAL ADMINISTRATION'

Educational administration, as a social practice, has a history as long as that of schools themselves; research into educational administration came very much later, with the doctoral theses of Cubberley and Strayer completed at Teachers College, Columbia University in 1905 being taken by some² as the founding work in the field. Discourse about the philosophical assumptions of research into educational administration is of more recent origin, having been engaged in for a little more than forty years.

Prior to 1950, almost nothing appears to have been written on the philosophy of research into educational administration. Although Cummings³ argued in 1936 for the theoretical unity of quantitative and qualitative inquiry in the field, his analysis was completely ignored by both his contemporaries and those who were to follow. Consequently, research into educational administration consisted of what Griffiths and Halpin later came to call 'naked empiricism'⁴ - atheoretical and inductive inquiry accompanied by prescriptive direction. Perhaps this was not altogether surprising since most professors of educational administration were ex-practitioners more interested in school-based consultancies and conducting school surveys⁵ than engaging in serious research. Few had any substantive research training and their research skills were rather primitive.⁶ Halpin's wry comment of "instruction by anecdote, often given by men in their anecdotage"⁷ aptly explains why philosophical discourse about research into educational administration was completely absent.

Organized opposition to the presuppositions of traditional research began to emerge with the growth of the 'theory movement' in the mid-1950s. The impetus for change came initially from a select group of social scientists imbued with the culture of logical positivism who were to have a marked impact on researchers.

Three particular social forces associated with the theory movement were seminal in stimulating the transformation of the field.⁸ The first was the National Conference of Professors of Educational Administration (NCPEA), established in 1947. The function of theory in research was initially discussed at the 1954 meeting of NCPEA at Denver, where social scientists met with professors of educational administration to challenge the type of thinking then prevalent. Coladarci, Getzels and Halpin all pointed out that research into educational administration was distinctly atheoretical and sloppy in quality, so it was understandable that their reception by conference participants was anything but cordial.⁹ Two influential publications followed: Coladarci and Getzels' *The Use of Theory in Educational Administration*¹⁰ was stimulated in part by their participation at the conference, while the specially commissioned book edited by Campbell and Gregg, *Administrative Behaviour in Education*¹¹ contained chapters on theory and research by Griffiths¹² and Halpin.¹³

The Co-operative Programme in Educational Administration (CPEA) was a second major influence. Begun in 1950 with support from the Kellogg Foundation, a number of administrative centres were established under its auspices to promote research.¹⁴ Several centres brought in social scientists to advise on research, some of whom attended the 1954 NCPEA meeting and later co-sponsored (with UCEA) and contributed to a seminar on administrative theory and research at the University of Chicago in 1957. This was followed by a second conference on research and practice culminating in Campbell and Lipham's edited proceedings, *Administrative Theory as a Guide to Action*.¹⁵

The third major influence was the University Council for Educational Administration (UCEA), founded in 1956. The 1957 co-sponsored seminar with the CPEA Chicago Midwest Centre was a major landmark; the contributions were published in Halpin's edited volume, *Administrative Theory in Education*,¹⁶ with Halpin's¹⁷ own paper being seminal as a prime mover of logical positivism. In later years, UCEA was to sponsor further seminars on theory and research.¹⁸

Few in educational administration were to embrace the logical positivism of the social scientists more thoroughly than Griffiths¹⁹ who quickly became a committed advocate of their philosophical position. Griffiths was to make a major contribution to the dissemination of logical positivism in educational administration through three noted

publications: *Administrative Theory*²⁰ appeared in 1959, *Research in Educational Administration: An Appraisal and a Plan*²¹ was published in the same year, along with his editing of and contributing to the 1964 Yearbook of the National Society for the Study of Education, *Behavioural Science and Educational Administration*.²²

Thus, within a decade the theory movement was to have a profound impact on thinking about research into educational administration. Despite the fact that the movement itself had a relatively short life, and members were few, the philosophy of logical positivism quickly became a theoretical orthodoxy. The force of the movement was widely felt; members occupied influential academic positions and were able to control graduate programmes and research projects.²³ They organized and contributed to seminars and conferences which generated a new body of literature by which their ideas for the scientific study of educational administration were disseminated, several CPEA centres and the UCEA were directly shaped by their influence, and they founded, edited and wrote for a new journal, *Educational Administration Quarterly*. In short, the ideology of the theory movement began to seep into the consciousness of those teaching and researching educational administration. Yet there is evidence to suggest that the impact of the theory movement was less than its proponents had imagined.²⁴

Criticism of the basic tenets of the theory movement tended to be rather muted: Culbertson,²⁵ Graff and Street,²⁶ McClellan,²⁷ Schwab²⁸ and Trow²⁹ were early critics who pointed to various theoretical difficulties with the philosophical approach taken, but their analyses were largely ignored. Halpin³⁰ was later to re-evaluate the theory movement, recanting on his initial enthusiasm for logical positivism and scientific inquiry, yet few paid heed to his strictures.³¹ The advocates of positivist research were able to disregard their critics for twenty years; however, they were eventually compelled to confront the challenge of a competing philosophical tradition.

The first inkling of an alternative epistemology was to be found in Halpin's³² admission that existentialist philosophers spoke a message he could not ignore. His hope that others would also be attracted to this philosophical stance and encompass it within the study of educational administration was in due course fulfilled by the work of Gibson,³³ Greenfield³⁴ and others.

The 1974 International Intervisitation Programme (IIP) in Educational Administration held in Britain stands as a widely recognized landmark in the debate over

the philosophical assumptions of research into educational administration, for it was at Bristol that Greenfield³⁵ launched the first sustained attack on positivist research through his espousal of a phenomenological perspective. Since Greenfield's arguments represented "a challenge to the domination of the norms and criteria for legitimate research and scholarship in the field by the 'theory-based' advocates"³⁶ and heralded "a period of examining the epistemological assumptions which undergirded the theory movement"³⁷ then the reaction of those in the 'theory priesthood'³⁸ was predictable. The reports on the different reactions to Greenfield's paper are widely discrepant, and this in part reveals the 'political power plays' of those centrally involved in the debate. Griffiths claims he "was quite surprised to note the opposition it provoked. This was especially true of the Australians, almost equalled by the Canadians and those from the developing Commonwealth countries."³⁹ To Crane and Walker, both Australians, "it was the *Americans*, notably Dan Griffiths himself, rather than those from other countries who were provoked."⁴⁰ However, Griffiths did concede that

to many in the conference phenomenology was a brand new word and it was made the butt of jokes and off-hand comments. To the British and the few Europeans on the scene, it was familiar and was the object of great excitement. To the Americans, it was the cause of considerable consternation."⁴¹

So, perhaps Greenfield's wonderment "why Jovian shafts of displeasure flashed at me from senior American scholars present at the conference and why they responded to the paper as though it defiled the holiest places in the temple"⁴² was warranted. For Greenfield, the political backlash from his North American colleagues was to be long-lasting and deeply felt:

My chief frustration stemming from the IIP 1974 and from some subsequent experiences connected with it comes from seeing the paper largely ignored on this side of the Atlantic or interpreted by persons who simply discount or misread most of what it had to say. The cause celebre of 1974 will apparently have no echo in the IIP 1978. Certainly I have not been asked to do anything for this Canadian-based conference which is being organized by colleagues in this country. This comment is not to deny value in the forthcoming conference simply because I won't be part

of it, but I do get the sense that my colleagues on this side of the Atlantic are not anxious to fuel any more IIP controversies. Instead they have largely contented themselves with seeing the issue of the 1974 controversy as an unfortunate battle in rather poor taste which somehow demeans theory and the past glory of the field of study.⁴³

The subsequent dispute between Greenfield⁴⁴ and his principal critics, notably Griffiths,⁴⁵ Hills⁴⁶ and Willower,⁴⁷ where it rose above the ad hominem and the vacuous⁴⁸ did much to structure the ensuing debate.⁴⁹

Greenfield remained undaunted by the almost overwhelming criticism of his advocacy of subjectivism⁵⁰ and continued to present his views at various forums. At a joint UCEA/University of Rochester seminar held in 1977 on theory and research in educational administration, the battle lines were sharply drawn

between those who seek on the one hand to improve administrative theory by better and more sophisticated technology and those who argue on the other hand that such improvements can only come through new methodologies and qualitatively different kinds of ideas for understanding and directing them.⁵¹

At about this time, the annual meeting of the American Educational Research Association (AERA) began to assume increasing importance as a forum for discourse about research into educational administration. At the 1977 meeting, in a symposium on 'Contemporary theory development and educational research', Greenfield⁵² examined the ideological dimensions of scientific research. He has continued to use this and other gatherings⁵³ as a means of promoting his arguments, although without stimulating the same degree of reaction as did his IIP74 paper. Two further milestones stand out in Greenfield's history. In December 1992, his jointly edited book consisting of ten of his better known articles, was published. *Greenfield on Educational Administration: Toward a Humane Science*⁵⁴ has since been the subject of a review symposium contributed to by such commentators as Cahill,⁵⁵ Gronn,⁵⁶ Lakomski and Evers,⁵⁷ Ribbins,⁵⁸ Stapleton⁵⁹ and Thody.⁶⁰ In one of his last publications, Greenfield⁶¹ had written about re-reforming and re-evaluating educational administration, and asked whence and when comes the phoenix? It was perhaps fitting that at the 8th International Intervisitation Programme in Educational Administration held in Toronto,

his home town, his achievements should be honoured with a Greenfield Day entitled 'After Greenfield: Whence and Whither Comes the Phoenix?' It was also fitting that speakers from across the spectrum of the theory debate should contribute: Allison,⁶² Bates,⁶³ Evers,⁶⁴ Gibson,⁶⁵ Griffiths⁶⁶ and Ribbins.⁶⁷

While Greenfield has been dominant in the interpretive mould, such that his writings have radically transformed thinking about research into educational administration, it must be recognized that he does not stand alone. From much of the American-based literature it would appear that Greenfield has been the sole advocate of a subjectivist-phenomenological philosophy.⁶⁸ This is not so.

Those who have explicitly adopted Greenfield's thesis, or share one similar to it, include Bruce,⁶⁹ Gibson,⁷⁰ Gray,⁷¹ Hill,⁷² Hobbs,⁷³ Ribbins et. al.⁷⁴ and Sungaila.⁷⁵ Others sympathetic to the general position include Bates,⁷⁶ Bone,⁷⁷ Gronn,⁷⁸ Harrison,⁷⁹ Hodgkinson,⁸⁰ Innes-Brown,⁸¹ Sergiovanni⁸² and Vandenberg.⁸³ More recently, Ribbins, Gronn and Hodgkinson have become more influential: Ribbins⁶⁴ as a collaborator with and a commentator on Greenfield; Hodgkinson⁸⁵ who, as a fellow Canadian, both influenced and was influenced by Greenfield, has published a new book on the moral art of educational leadership which has also been the subject of a review symposium consisting of Evers,⁸⁶ Van de Pitte⁸⁷ and Williams;⁸⁸ Gronn⁸⁹ has also been active in defending Greenfield while critiquing Hodgkinson and Evers and Lakomski.

Four years after Greenfield's celebrated presentation, Culbertson, at the next IIP held in Canada in 1978, announced that "if we were to use the Hegelian concept of thesis (the theory movement of the 1950's and 60's) and anti-thesis (the phenomenological view of theory), we can conclude that we have not yet achieved a useful synthesis."⁹⁰ However, such a possibility began to emerge shortly thereafter.

Foster,⁹¹ drawing on the work of Habermas,⁹² sought a synthesis grounded in critical theory which would retrieve the merits yet transcend the limitations of both positivist and interpretive inquiry. Foster's analysis strongly influenced Bates to adopt critical theory as the philosophical basis of his theorizing.⁹³ For the two of them, the AERA annual meetings became the vehicle for the development and defence of their arguments. Both presented papers⁹⁴ at a 1982 AERA symposium on critical theory in which they set out the fundamental presuppositions of their position. Three years later, at a further symposium on critical theory, marxism and educational administration at the

1985 AERA meeting, Bates⁹⁵ and Foster⁹⁶ offered additional justification of their thesis against a determined attack by Lakomski⁹⁷ and Willower.⁹⁸

The politics of the debate are again apparent in the reactions of some critics of critical theory. Willower is one who has consistently linked the philosophical assumptions of neo-marxist critical theory to the political structure of totalitarian socialist states, thereby denigrating and rejecting critical theory by association:

...the efforts of neo-Marxists to go beyond a few of the more dubious tenets of classical Marxism...are intellectually burdened by the common commitment of Marxist scholars to the Marxist political program. To remain in good standing politically, these scholars often affirm their loyalty by framing their views as interpretations or reinterpretations of Marx, Engels, or Lenin. Their lot is enormously complicated by the leadership of the USSR in the worldwide political movement since that nation is both the source of a highly dogmatic Marxism and an authoritarian state. In any case, the use of the dialectic method in current Marxist thought has to be understood in terms of its subordination to ideology and political context.⁹⁹

In a scathing response, Bates maintains that Willower rejects critical theory because of its potential for political subversion of the American way of life rather than for any scholarly reasons:

...the most that can be said for Willower's position is that it might best 'be understood in terms of its subordination to ideology and political context' - an accusation he levels against the general, undefined category of Marxist scholars. The worst that might be said is that in his purported analysis of Marxist scholarship 'ideology displaces empirical work and critical analysis'. Until such time as Willower provides such empirical referents and critical analysis it would seem proper to treat his statements on such matters as ideological commitments rather than as works of scholarship.¹⁰⁰

Critical theory has continued to be championed by a number of researchers.¹⁰¹

The emergence of a fourth broad tradition of philosophical thought has stimulated further debate about the nature of research into educational administration.

Willower,¹⁰² in advancing a philosophical blend of naturalism, instrumentalism, empiricism and pragmatism, was a precursor of the materialist pragmatism thesis of Evers and Lakomski.¹⁰³ Rooted in the 'new' philosophy of science, especially that of Quine¹⁰⁴ and branching out of a larger philosophical research programme being pursued by Evers and Walker,¹⁰⁵ their position is dismissive of logical positivism, phenomenology and critical theory. At the first conference of the Group for Research in Educational Administration Theory (GREAT) held at Deakin University, Australia, in 1984, Evers¹⁰⁶ and Lakomski¹⁰⁷ provided a preliminary statement of their case. They have since elaborated upon the initial description of their philosophical stance: Evers¹⁰⁸ at the third annual GREAT conference at the University of New England, Lakomski¹⁰⁹ at AERA and elsewhere, while both have contributed chapters¹¹⁰ to Macpherson's *Ways and Meanings of Research in Educational Administration*.¹¹¹ Since then they have gone on to publish a number of studies,¹¹² both criticising opposing philosophical traditions and elaborating further their own position. In 1991 their book *Knowing Educational Administration: Contemporary Methodological Controversies in Educational Administration Research*¹¹³ was published. It contained a number of their earlier writings including attacks on positivism, Greenfield, Hodgkinson and critical theory. Their work has since become the focus of critical examination: in a symposium where they restated and amplified their position,¹¹⁴ Bates,¹¹⁵ Gronn and Ribbins¹¹⁶ (on behalf of the deceased Greenfield), Hodgkinson¹¹⁷ and Willower¹¹⁸ all, to varying degrees, responded negatively. Elsewhere Maddock¹¹⁹ has offered a critique of what he called the three dogmas of materialist pragmatism. Their rejoinder,¹²⁰ while attending to philosophical matters, noted that the expression 'materialist pragmatism' has since been replaced by the term 'naturalistic coherentism'. The attack on a naturalistic philosophy mounted by phenomenologists (or subjectivists) and critical theorists, amongst others, has more recently been joined by a new philosophical standpoint, that of postmodernism.¹²¹ However, Willower¹²² has concluded that one version or another of naturalism will in due course become more widely adopted. Whether he is right remains to be seen.

There is little doubt that the theory debate in educational administration will continue. Although the arguments clearly fall within the realm of academic inquiry, it is patently obvious that the discourse, while concerned with philosophical issues, rarely

measures up to the standards of intellectual rigour one expects to find in general philosophy and philosophy of education. On the contrary, philosophical acumen is all too often over-shadowed by political manoeuvrings whereby ideological considerations, vested interests, personal careers and institutional power all combine to give form to several closed communities of small numbers of theorists. The debate has been primarily political with philosophy only as a service aspect. Yet, in the end it is the philosophy which is important if the debate is to be more than polemical rhetoric. It is indeed fortunate that a few philosophers of education have recently begun to inject a measure of intellectual rigour into thinking about the philosophical assumptions of research into educational administration.

Philosophical Pluralism

In any analysis of the competing traditions of philosophical thought as they bear on research into educational administration, it is important to realize that while there is substantial agreement among the proponents of each position on the core presuppositions of their research programme, there is also considerable divergence on particular parts of the whole. In addition, external criticism has led to modifications in the initial theoretical formulations such that the philosophies, far from being static and immune from criticism, stand in a dynamic relationship to one another as the thrust of argument and counter-argument has compelled those engaged in the debate not only to reconsider their own basic assumptions about inquiry but also those of their opponents. The historical and evolving character of these philosophical traditions makes the task of portraying them in detail a particularly difficult one. Nevertheless, to do justice to their complexity and to avoid charges of 'strawmen'¹²³ which are frequently levelled at opponents in the debate, it is essential that a full and accurate account be given of each philosophical tradition. It should also be noted that the labels attached to the philosophical traditions serve more as a heuristic device for analysis than as a strict categorization or philosophical demarcation which would necessarily be accepted by all of the participants in the debate.

The theory debate in educational administration has been particularly wide-ranging, covering such issues as the nature of theory, the processes of inquiry and the

implications for administrative practice. A considerable literature has been generated on these matters, not all of which was relevant to this thesis. Because the focus was on the nature of research, many of the issues which address matters of administrative practice were put to one side since they were deemed to be largely irrelevant to the topic being investigated. The effect of this was to limit discussion of the central ideas of each philosophical tradition to those which bore directly on research into the administration of educational organizations rather than those central to administrative practice itself. While this led to the neglect of some key themes in the overall theory debate, their exclusion was justified on the ground that they were peripheral to the thrust of the thesis. In short, a decision was made early on to limit discussion to only those philosophical ideas which contributed directly to illuminating the research process. A second constraint applied. Discussion of the philosophical ideas of the participants in the ongoing theory debate was limited to those views contained in the literature which was explicitly in the domain of educational administration. Because the focus was on explicating the philosophical disputes within educational administration, the participants' writings in other branches of educational inquiry was to a large extent disregarded, although not entirely so. A third constraint was placed on the discussion of rival philosophical traditions. The key ideas and assumptions set out in the various chapters are stated in terms employed by the participants in the theory debate, some of whom are skilled philosophers and others not. A determined effort was made to set down an accurate account of each position which would reflect not only the views of the main participants (however philosophically sophisticated or naive they might be), and be acceptable to them, but at the same time offer a sufficiently broad-based picture of each tradition which encompassed the views of the minor players, all of which needed to be placed in a historical dimension to accommodate the various revisions to the positions which have occurred over time. A fourth constraint was this. Although passing reference is made to the parent traditions of philosophical thought and some of the important thinkers, no attempt was made to provide detailed studies of each of the main traditions as they appear in mainstream philosophical thought nor was an effort made to trace out the linkages between the original philosophies and their derivatives in educational administration. This would have been a task of enormous proportions and deflected the focus away from the main task of the thesis. To some extent it is assumed

that the reader will have some familiarity with the primary philosophies and will thus be able to adequately contextualize the secondary descendants. A fifth, and final, constraint was invoked. Although the various philosophical standpoints in educational administration are depicted in considerable detail, and some of the major arguments against them are considered, no attempt was made to examine the multitude of claims and counter-claims levelled by each against the others nor was the task of assessing the relative merits of the competing positions and resolving the dispute in favour of one undertaken. While the emergent lines of criticism directed at naturalism, especially the materialist pragmatism version, are more detailed than the criticism levelled at the other philosophical positions, the point of this is to draw attention to the sorts of objections being raised against it which a well-worked naturalized theory of research would need to address. If the sorts of worries raised by the critics of naturalized inquiry in educational administration are to be adequately dealt with, then there must be a return to the fundamental assumptions of naturalized philosophy. The aim, then, is not to 'blow away' the small players in educational administration by wheeling in the 'big guns' of philosophy; rather, the whole purpose of drawing off the work of Quine and the Churchlands in particular is to ground the construction of a naturalized theory of research which would not only tackle the objections raised by those in educational administration but would also set the philosophical agenda for what such a theory of research, when fully developed, might look like not only in educational administration research but in research generally.

We turn, next, to an examination of logical positivist thought in educational administration, a philosophical position adopted by those in the theory movement.

NOTES

- 1 This account is a rational reconstruction of past events. The drama and tension surrounding them are touched upon but not fully explored. Halpin (1965,50) in his review of the 1964 Yearbook of the National Society for the Study of Education (Griffiths, 1964a) decries this editing out process, but since this chapter presents only a brief historical analysis, the 'juicier' bits as Halpin calls them are excluded. The discussion is also limited in terms of Griffiths' (1958a,1) observation that
 - the events surrounding the birth and relatively short life of the theory movement are beginning to be shrouded in mist. Most of those present at the birth are either dead or retired. Much of the present-day discussion of the theory movement is carried on by those whose sources of knowledge are either hearsay or the sparse written accounts and articles and books of the period.
- 2 Campbell & Newell, 1973, 1; Culbertson, 1980, 322.
- 3 Cummings, 1936. If Cummings' analysis had been adopted, it is possible that the ideological distinction between quantitative and qualitative research into educational administration might have been avoided.
- 4 Griffiths, 1965, 34; Halpin, 1957, 197; 1958, 1.
- 5 According to James (1987, 9) these surveys were efficient ratings of the school site - facilities, financial support, qualifications of employees, school programmes, and so on. See also Campbell, et. al., (1987, 173-4).
- 6 Halpin, 1970, 159-60; Jennings, 1979, 255-6.
- 7 Halpin, 1970, 159-60. Walton (1955, 169) writes of "a description of practices, the cautious recommendations of promising techniques, personal success stories, and lively anecdotes, all surrounded with the aura of common sense, and often purveyed by a more or less successful administrator."
- 8 For a more detailed historical account of the NCPEA, CPEA and UCEA, see Moore (1964).
- 9 Halpin, 1970, 161. The confrontation between the social scientists and the professors of educational administration is also examined by Griffiths (1983, 202) and Halpin & Hayes (1977, 265).
- 10 Coladarci & Getzels, 1955.
- 11 Campbell & Gregg, 1957.
- 12 Griffiths, 1957.

- 13 Halpin, 1957.
- 14 Centres were established at the University of Chicago, Teachers College Columbia University, Harvard University, George Peabody College for Teachers, University of Texas, University of Oregon, Ohio State University and Stanford University. According to Halpin (1965, 52) the 8 CPEA centres did not contribute equally in research production , and taken as a whole 'the bulk of the stuff turned out in the name of research was trash."
- 15 Campbell & Lipham, 1960.
- 16 Halpin, 1958a.
- 17 Halpin, 1958b.
- 18 Culbertson & Hencley, 1963; Immegart & Boyd, 1979a.
- 19 In a biographical note, Griffiths (1985b, 2) traces his conversion to logical positivism:
 As a young man I was attracted to logical positivism because my training was in mathematics and science. I...was thoroughly disgusted with what passed for research and serious thought in educational administration and was influenced by a number of social scientists trained in the logical positivist mode (Halpin, Hempill, Getzels and Gross). It seemed to me that the logical positivist approach was the proper antidote...for the plain nonsense that constituted the field of educational administration.
- 20 Griffiths, 1959a.
- 21 Griffiths, 1959b.
- 22 Griffiths, 1964a, b.
- 23 Haller, (1968, 62), referring to Button (1966, 216), argued that the theory movement represented "an ideology subscribed to by a significant number of professionals who, if not a majority, certainly appear to control the academic study of administration at the major universities."
- 24 In his analysis of the research produced by leading members of the theory movement, Griffiths (1983) revealed how their research practices remained largely detached from their philosophical assumptions. Three surveys of professors of educational administration also revealed that the influence of the theory movement was less extensive than claimed. Hills (1965a) reported that 53% of the 102 professors surveyed did no research while only 1% devoted more than 40% of their time doing so. Only 19% of research projects involved tests of theoretically derived hypotheses. However, the respondents were more familiar with the literature associated with the theory movement: Campbell and Gregg (1957) - 85%, Coladarci and Getzels (1955) - 58%, and Halpin (1958) - 56%. Things had not greatly improved when Campbell and Newell (1973a, b) reported their findings of a survey of 1300 professors of educational

administration. 28% did no research while only 2% spent 50% of their time on research and scholarly writing. Only 6% thought *Educational Administration Quarterly* to be a professionally relevant journal while 68% agreed that the literature in educational administration should be theory based. In a more recent study of 1300 professors of educational administration, McCarthy (1987; et. al., 1988) found that the proportion of professors engaged in research had increased from 47% in 1965 (Hills, 1965a) to almost 80% in 1986, while those who devoted at least 10% of their time to research had increased from under one third (1965) to almost a half. One major negative finding was that while 68% of the 1972 study (Campbell & Newell, 1973a, b) agreed that the literature in educational administration should be theory based, by 1986 only 38% shared this view. For McCarthy (1987, 5)

it was disturbing that half as many respondents in 1986 as in 1972 indicated that the literature in our field should be theory based. Possibly this change in sentiment has occurred because of the failure to produce a unifying theory and the inadequacies of present theories to explain, predict, and influence what is happening in educational organizations. However, disillusionment with the search for generalized laws does not necessarily negate the importance of theory development. Emerging perspectives on the nature of organizations - alternatives to the traditional positivist paradigm - have promise for enhancing our understanding of schools. On the question of research methodology, while 21% emphasized qualitative research, and 70% gave preference to quantitative approaches, 52% of respondents sought a balance between the two.

Overall, McCarthy, et. al. (1988,113) concluded that "there was a size in commitment to...qualitative research. Also evident was a declining faith in theory and empirical research as near-exclusive sources of knowledge in our field."

25 Culbertson, 1965.

26 Graff & Street, 1957; Graff, Street, Kimbrough & Dykes, 1966.

27 McClellan, 1960.

28 Schwab, 1964.

29 Trow, 1959.

30 Halpin, 1969, 1970,; Halpin & Hayes, 1977.

31 Another leading proponent of the theory movement who also began to express doubts was Griffiths (1979b, 44). However, in the end he was unable to cut himself completely adrift from logical positivism.

32 Halpin, 1969, 12.

33 Gibson, 1972.

34 Greenfield, 1973.

- 35 Greenfield, 1975a. Griffiths (1988,30) notes that while the theory movement had been in decline for a number of years, the demise came at IIP74 with the coup de grace delivered by Greenfield (1975a).
- 36 Kendell & Byrne, 1977, 12.
- 37 Culbertson, 1980, 328.
- 38 The term 'theory priesthood' was first used by Griffiths (1975, 12) to attack other participants at IIP74, but was later used against him by Crane & Walker (1976, 38) and Greenfield (1976,5).
- 39 Griffiths, 1975, 12.
- 40 Crane & Walker, 1976,38.
- 41 Griffiths, 1975, 16.
- 42 Greenfield, 1976,5. As Layton (1974, 10) noted, some thought Greenfield's (1975a) paper hopelessly naive and "tried to convince the author of the error of his ways." For more detailed accounts of IIP74 reaction to this paper see Crane & Walker (1976), Greenfield (1976, 1977, 1978a), Griffiths (1975) and Layton (1974).
- 43 Greenfield, 1977,83.
- 44 Greenfield, 1975b, 1976, 1977, 1978a, 1980.
- 45 Griffiths, 1975, 1977.
- 46 Hills, 1975d, 1980.
- 47 Willower, 1979a, b, 1980, 1981.
- 48 Kendell & Byrne (1977, 12) argue that those engaged in the debate have been "talking past each other," using different "sets of meanings" for such concepts as science, theory and knowledge.
- 49 There were a number of other early respondents to Greenfield's (1975a) paper. Those generally supportive included Bone (1976), Bruce (1977), Gray (1978), Gibson (1977), Harrison (1976), Hobbs (1977), and Silver (1978), while Levine (1975), Monahan (1975b), Russell (1976) and White and White (1976) were critical of his position. More neutral analyses came from Herda (1978) Hoyle (1976) and Kendall and Byrne (1977).
- 50 Initially, Greenfield (1975a) linked his position to phenomenology. Following Willower's (1979a, b) criticism that this had little to with 'philosophical phenomenology' (Husserl, 1970), Greenfield has since referred to his stance as 'subjectivist'. For an elaboration of this point, see Gronn (1983).
- 51 Greenfield, 1979c, 227. The participants at the seminar who are presumed to fall into the first category include Getzels (1979), Griffiths (1979a) and Willower (1979a) while Gibson (1979) and Greenfield (1979b) constitute the second

group.

- 52 Greenfield, 1979b.
- 53 Other papers presented at AERA meetings include Greenfield (1982, 1983a, 1984a, 1986). Various other venues include the British Educational Administration Society conference (Greenfield, 1979c), the Victoria Institute of Educational Administration in Australia (Greenfield, 1981) and the Canadian Society for the Study of Educational Administration (Greenfield, 1985b).
- 54 Greenfield & Ribbins, 1993.
- 55 Cahill, 1994.
- 56 Gronn, 1994a.
- 57 Lakomski & Evers, 1994a.
- 58 Ribbins, 1994b.
- 59 Stapleton, 1994.
- 60 Thody, 1994.
- 61 Greenfield, 1991.
- 62 Allison, 1994.
- 63 Bates, 1994a.
- 64 Evers, 1994a.
- 65 Gibson, 1994.
- 66 Griffiths, 1994.
- 67 Ribbins, 1994a.
- 68 Willower, 1988, 740.
- 69 Bruce, 1977.
- 70 Gibson, 1972, 1977.
- 71 Gray, 1978, 1980, 1982.
- 72 Hill, 1983.
- 73 Hobbs, 1977.
- 74 Ribbins, et. al., 1981.
- 75 Sungaila, 1979, 1982.
- 76 Bates, 1979a.
- 77 Bone, 1976.
- 78 Gronn, 1983, 1994b.
- 79 Harrison, 1976.

- 80 Hodgkinson, 1978a, b, 1983, 1986b.
- 81 Innes-Brown, 1993.
- 82 Sergiovanni, 1981.
- 83 Vandenberg, 1982.
- 84 Greenfield & Ribbins, 1993; Ribbins, 1994b.
- 85 Hodgkinson, 1991.
- 86 Evers, 1993.
- 87 Vande Pitte, 1993.
- 88 Williams, 1993.
- 89 Gronn, 1993, 1994a; Gronn & Ribbins, 1993.
- 90 Culbertson, 1980, 329.
- 91 Foster, 1980a, b.
- 92 Habermas, 1970, 1971, 1975.
- 93 Initially, Bates (1980a) had employed the 'new' sociology of education to underpin his writings in educational administration but this soon gave way to critical theory. Others to adopt a Habermasian critical theory perspective include Prebble & Stewart (1986) and Watkins (1983, 1986).
- 94 Bates, 1982; Foster, 1984.
- 95 Bates, 1985.
- 96 Foster, 1985.
- 97 Lakomski, 1987c.
- 98 Willower, 1985c.
- 99 Willower, 1986d, 42.
- 100 Bates, 1985a, 3-4.
- 101 Bates, 1993, 1994b; Dolmage, 1992.
- 102 Willower, 1981, 1983b, 1985b, 1992a.
- 103 Evers and Lakomski, along with Walker, who have done much to develop a materialist pragmatist philosophy, are all Australians. The mutual recognition by materialist pragmatists (Evers and Lakomski) and pragmatic naturalists (Willower) that their arguments have much in common is an important development. Commenting on Lakomski's (1985a) ideas, Willower (1986b, 135) writes:
 Lakomski's paper represents a welcome addition to the effort to furnish a non-positivist, non-subjectivist, non-Marxist alternative

for educational administration. The position she takes is in the same general philosophical camp as the instrumentalist - pragmatist - naturalist perspective I have proposed.

Likewise, with reference to his own materialist pragmatism, Evers (1987a, 73) notes that "there are some similarities between this position and the pragmatic naturalism of Donald Willower's research programme." See also Willower (1986a, 39; 1988, 742). One who claims to be increasingly attracted to the work of Evers and Walker is Macpherson (1987c, 164; 1987e, 12-3).

- 104 Quine, 1960, 1964, 1969a; Quine & Ullian, 1978.
- 105 Evers, 1984, 1987b; Walker, 1985, 1991; Walker & Evers, 1984, 1986, 1988.
- 106 Evers, 1985a, b.
- 107 Lakomski, 1985a.
- 108 Evers, 1987b.
- 109 Lakomski, 1985b, 1987a, c, d.
- 110 Evers, 1987a; Lakomski, 1987b.
- 111 Macpherson, 1987a.
- 112 Evers, 1988, 1990b, 1990c, 1993, 1994b; Evers & Lakomski, 1993a, 1993b, 1993c, 1994a, 1994b, 1994c, 1995; Lakomski, 1987d; Lakomski & Evers, 1994a, 1994b.
- 113 Evers & Lakomski, 1991.
- 114 Evers & Lakomski, 1993a, 1993b.
- 115 Bates, 1993.
- 116 Gronn & Ribbins, 1993; Ribbins, 1993.
- 117 Hodgkinson, 1993.
- 118 Willower, 1993.
- 119 Maddock, 1994a.
- 120 Evers & Lakomski, 1994a.
- 121 Barlosky, 1995a, 1995b; Bigum & Green, 1993; Evers & Lakomski, 1995.
- 122 Willower, 1988, 744.
- 123 One who regularly accuses his opponents of constructing and attacking 'strawmen' is Willower (1979, 33; 1982,6; 1985,7; 1988,740).

CHAPTER TWO

PHILOSOPHICAL TRADITIONS OF RESEARCH INTO EDUCATIONAL ADMINISTRATION (1) : LOGICAL POSITIVISM.

Researchers have always talked about their work, and those in educational administration are no exception. Most often their discourse remains at the technical level of particular methods and techniques, but on occasions their interest is drawn to discussion of the very nature of the research enterprise itself. When this happens their discourse becomes increasingly philosophical as they seek a solution to the problem of what are the proper foundations of research in educational administration. And, what initially begins as a naive grasp of the issue has the potential to lead to more sophisticated understanding when researchers' philosophizing is subjected to critical scrutiny.

NAKED EMPIRICISM'

For the first half of the twentieth century, research into educational administration was primarily directed at the collection of facts through survey methods. At the time it was thought that "if enough facts were gathered they would automatically pattern themselves and produce their own theory."² Rice, an early advocate of inductivist-empiricist inquiry, argued for "the publication of facts, suggestive opinions based on the facts, and suggestions of new ways of getting at the facts."³ Researchers heeded the call: Strayer, for example, gathered masses of facts about schools in his numerous surveys while Cubberley set out to collect 'half a ton of material' on schools and their administration.⁴ As a consequence an enormous amount of data was gathered, especially on the personal characteristics of school administrators and members of school boards.

A sustained critique of this type of research began to emerge in the mid-1950s. Naked empiricism was roundly discredited on the grounds that it encompassed "approaches in which we madly collect data first, and then, at the analysis stage, gaze with mute bewilderment at a pile of data and wonder just what, if anything, we can do

with it."⁵ A standard reaction against inductive inquiry was to quote Cohen's admonition: "Begin by collecting the facts? Aye, but what facts?"⁶ for, as Getzels et. al. pointed out, observations and measurements, no matter how precise, do not of themselves lead to stable, practical knowledge except through the application of some directing concepts, however tentative, that serve as guides to *what* to observe and measure and *how* to interpret what has been observed and measured."⁷

As a consequence, naked empiricism was rejected in favour of theory-based research.

LOGICAL POSITIVISM

The demand that research into educational administration be theoretically determined was conceptually linked to the adoption of logical positivism, albeit a simplified and modified version of that espoused by the Vienna Circle.⁸ The appropriation of logical positivism into educational administration was rooted in two sources; the first was selected ideas from the work of Feigl,⁹ a member of the Vienna Circle, while the second was the writings of Simon who introduced logical positivism into administrative thought. There appears to be little evidence that the founders of the theory movement read widely in the philosophical literature on logical positivism.¹⁰ Rather, the links are limited to Feigl's¹¹ contribution to a symposium on the principles of theory construction in psychology and Simon's *Administrative Behaviour*,¹² both of which served as well-springs for theoretical development in educational administration¹³. For the first time, the background philosophical presuppositions were made explicit, although their justification rested more on assertion than rigorous argumentation.

For those imbued with the spirit of logical positivism, a fundamental philosophical assumption was contained in the belief that there exists an independent reality, separate from mind, and ultimately knowable.¹⁴ Hills put the position thus:

I would imagine that most scientists of whatever persuasion begin with the assumption that there is a real world 'out there', and that elements of it can be 'discovered' and represented symbolically through the application of scientific method. It may also be that some would hold that the world is knowable as it is.¹⁵

Quite what constitutes reality was rarely examined in any depth; the clearest descriptions provided include 'objects and 'situations',¹⁶ 'events',¹⁷ 'things',¹⁸ 'entities',¹⁹ 'the material'²⁰ and 'phenomena'.²¹ That the early positivists in educational administration were realists is undeniable; whether their realism was metaphysical or empirical is more difficult to determine. While all forms of realism posit an independent reality, the point at issue between metaphysical realism and empirical realism is not whether such a world is knowable, for both are in agreement that it is, but rather whether reality consists of more than that which is known. In describing metaphysical realism, Hills suggested that "for most of us, most of the time, the environment consists of ready-made, pre-existing objects, properties and actions."²² However, the standard of 'reality' generally accepted in scientific circles is 'empirical verifiability' or empirical realism.²³

While unequivocal agreement was reached on the existence of an external reality, the same could not be said about the apprehended relationship between reality and our beliefs about that reality. Griffiths argued that "each word should have a clearly understood referent, that is, an object or situation in the real world to which the word or label refers,"²⁴ while Halpin, presenting a contrasting view, noted that "words are man-made; because a word exists we have no guarantee that there exists 'out there' a 'thing' that corresponds to the word."²⁵ For Halpin, "the cogent question is whether the verbal categories we posit correspond to events in the 'real' world."²⁶

There was general recognition that the world is not directly apprehended, but rather that our knowledge of reality is mediated through conceptual structures. Griffiths²⁷ was to conclude that one 'imposes' order on reality rather than 'discover' order in reality while Halpin,²⁸ more conscious of the complexity of the problem, contended that language itself structures our experience of reality and that our conceptions of reality are limited in part by our language. In a similar vein, Coladarci and Getzels argued that "language, at its very best, can only be an approximation of the non-verbal reality it attempts to describe,"²⁹ while Campbell wrote of "getting a closer and closer 'fix' on reality."³⁰

Although an explicit theory of truth was never stated, contextual evidence clearly reveals an implicit acceptance of a naive correspondence theory of truth which "holds those propositions to be true that correspond with observed facts."³¹ Griffiths' notion that facts are things against which what we say about them can be assessed to be true

or false rested on his claim that one could 'look for' and 'gather' facts such that "theory gives meaning to the facts."³² On this account, facts are things in the world about which we can state propositions: if the stated proposition corresponds with the facts then the proposition is true; if it does not then it is false. Knowledge, or well-substantiated belief,³³ was therefore possible.

The boundaries of what can be meaningfully said about the world were severely circumscribed by those in the theory movement. The sharp distinction drawn between 'is' statements of fact and 'ought' statements of value, initially introduced into educational administration by Halpin³⁴ and widely adopted, was underpinned by the postulate that "propositions of fact can, at least in principle, be verified, but the propositions of value are in the realm of preference and cannot be verified empirically."³⁵ Taken as a given, the strict severing of the 'is' from the 'ought' was to serve as a guiding principle for inquiry in educational administration.³⁷

The translation of general conceptions of reality into more specific definitions of educational organizations was necessary if theory-based research was to get off the ground. Educational organizations, be they schools or universities, were conceptualized as social systems having sub-systems (eg. classrooms) and supra-systems (eg. the local community).³⁷ While general agreement could be reached on conceiving educational organizations as social systems³⁸ there was considerable divergence over what was meant by 'system'. A distinction was drawn between empirical systems and theoretical systems, the former being "sets of phenomena in the observable world that can be described and analyzed by means of theoretical systems" while the latter are "systems of symbols and propositions, connoting concepts and conceptions, and having both logical integration and empirical reference."³⁹

The view that educational organizations are empirical systems was not widely adopted, with Griffiths appearing to be one of the few proponents of such a conception. He simply defined a system as "*a complex of elements in mutual interaction*,"⁴⁰ and in elaboration went on to state that "a system is composed of *objects* which are part of the system and that there are relationships among the objects and their attributes which tie the system together."⁴¹

The more significant line of thought was that which conceived educational organizations as theoretical systems, a notion which was to strongly shape conceptual

understanding and empirical inquiry in educational administration. The earliest, and certainly most influential, theoretical explanation of organizations as systems was that developed by Getzels. Beginning with the assumption that the term 'social system' was conceptual rather than descriptive, Getzels⁴² went on to contend that social systems involve two classes of phenomena - the nomothetic and the idiographic. The nomothetic dimension encompassed institutions with certain roles and expectations that will fulfil the goals of the system; therefore,

Institutions are purposive. Institutions come into being or are established to carry out certain goals...The purposes of the institutions may be evaluated against the needs and goals of the social system, and the institutional practices may, in turn, be evaluated against the purposes of the institution. It is in this sense, for example, that one may think of certain institutional practices and indeed even total institutions as functional or dysfunctional to the social system.⁴³

The second dimension of social systems, the idiographic, comprised individuals with certain personalities and need-dispositions who inhabit the system. Their interaction constituted social behaviour which was understood as a function of three major elements of the nomothetic structure - institution, role and expectation.⁴⁴ Accordingly, "*institutions are peopled.* If institutions are to carry out their functions, human agents are required."⁴⁵ In short, organizations are real and exist independently of human beings, they have functions and goals of their own, and they structurally determine members' behaviour.

A very different conception of educational organizations and social systems has more recently been proposed by Hills, whose fundamental orientation is to be found in his assertion that "social systems theory is not a way of viewing organizations. Rather, it is a way of organizing experience that is an alternative to the way that leads us to speak of organizations."⁴⁶ The organization is not a system of any kind at all, rather, it is the empirical setting from which the cultural, social, psychological and behavioural systems are abstracted.⁴⁷ The social structure of an organization, or the pattern of relationships among actors and social objects that persist through time,⁴⁸ is embedded in the four systems which are both structured and structural elements of more inclusive systems. Such systems are structured by symbolic cultural codes consisting of sets of rules for

the correct use, transformation and combination of symbols.⁴⁹ Action is the control of expenditure of effort to realize symbolically defined intentions in symbolically defined situations; linguistically, all speakers of a code observe the norms of the code on penalty of not being understood, and cognitively, when an utterance is advanced as knowledge, propositions are evaluated according to standards of conceptual clarity, logical consistency, logical validity and empirical validity.⁵⁰

In contradistinction to functional analysis of a Parsonian genre, more simplified notions of organizational structure invoked conceptions of the organization itself having structure, or a stable pattern of relationships,⁵¹ entailing regularities in the way members of the organization deal with their on-going activity. Recognition of structural regularities led Hoy⁵² and Hoyle,⁵³ amongst others, to conclude that educational organizations, despite their many differences, have much in common. Like virtually all organizations, they tend to maintain structures that serve stabilizing functions through a system of norms which regulate the actions of, and the interactions between, members of the organization.⁵⁴ Such norms may be quite explicit (eg. school rules, ministry regulations) or understood but not explicitly articulated. Structurally, the norm-constituted actions of members of an organization have both anticipated and unanticipated consequences,⁵⁵ the latter ranging from those which should have been anticipated because the knowledge of their causal effects was available to those 'acts of God' beyond the control of the agent.⁵⁶

In formal terms, the conceptualization of the administration of educational organizations was largely circumscribed by Getzels' highly influential formulation: "structurally, administration is conceived as the hierarchy of subordinate-superordinate relationships within an institution. Functionally, this hierarchy of relationships is the locus for allocating and integrating roles and facilities in order to achieve institutional goals."⁵⁷ While there appears to have been little disagreement with Griffiths'⁵⁸ assumption that administration is the process engaged in by certain members of an organization to control and direct the activities of other members of the organization, the question of whether administration is a generalized type of behaviour to be found in all organizations evoked mixed reaction. Griffiths,⁵⁹ Halpin⁶⁰ and Walton certainly thought so, the latter arguing that "administration is basically the same in all organizations whether they be educational, industrial, government, military or ecclesiastical."⁶¹ Others

were not so sanguine. Campbell⁶² agreed that there is much in common in the administration of various types of organization, but declared that the nature of the educational enterprise, especially the learning-teaching process, makes educational administration a special case, a view shared by Graff and Street⁶³ and Hall.⁶⁴ Campbell's argument did not prevail, despite Halpin's⁶⁵ rapid conversion to a similar thesis whereby he distinguished between 'g' (general) factors to be found in administration qua administration and 's' (specific) factors that distinguished educational administration from other forms of administration. Only later did Walton⁶⁶ recant, acknowledging that administration varies with the purposes and the activities of the organization, while Griffiths,⁶⁷ questioning his own beliefs, has recently come to the conclusion that Campbell's⁶⁸ contention that educational administration is a special case is apparently correct.⁶⁹

Inquiry into the administration of educational organizations was premised on a number of basic principles, most of which were generally agreed upon by those in the theory movement. The fundamental axiom, first enunciated by Getzels, from which all else followed, was that educational administration is "a proper matter for scientific inquiry,"⁷⁰ a notion accorded widespread assent.⁷¹

Initially, the break with naked empiricism was rather blurred. Coladarci and Getzels⁷² and Griffiths⁷³ argued that theory construction took two forms: induction-deduction, whereby theory arrived at inductively is tested through a deductive process, and deduction-induction, by which a hypothesis is deduced and evidence collected to test its validity. However, it was left to Halpin⁷⁴ to inject a measure of rigour and precision into the analysis with his prescription that theory should be limited to hypothetico-deductive theory. In doing so Halpin⁷⁵ proposed that Feigl's definition of theory should provide the standard against which research into educational administration should be judged:

I propose to define a 'theory' as a set of assumptions from which can be derived by purely logico-mathematical procedures, a larger set of empirical laws. The theory thereby furnishes an explanation of these empirical laws and unifies the originally heterogeneous areas of subject matter characterized by those empirical laws.⁷⁶

No one did more over the years to promote Feigl's definition than Griffiths.⁷⁷ Some⁷⁸

were to emulate his conviction; others⁷⁹ were concerned that Feigl's definition ruled out almost everything done in educational administration.

On this strictly positivist account, science was comprehended as seeking to accomplish three tasks - description, explanation and prediction.⁸⁰ These were to be achieved through the formulation of theories from which hypotheses may be deduced which connect the theoretical abstractions with observations of the real world.⁸¹ The predictions carried by the hypotheses provide a means by which the explanations of social phenomena are either confirmed or rejected;⁸² concomitantly, the ability to explain and predict enhances the degree of control over organizational events.⁸³

A tight conception of regularity and causality was held. Sequences of cause and effect, or time-dependent regularities,⁸⁴ between two variables (classes of events or objects) with variations in one related to variations in the other⁸⁵ underpinned theoretical explanations of the connections and relationships between phenomena in the world. It is the regularities of administrative behaviour in organizational life about which generalizations can be stated that are the focus of scientific inquiry,⁸⁶ not the idiosyncratic or capricious actions of administrators.

The mark of a scientific theory was to be found in its testability; it must be logically capable of proof or disproof, though it need not have been tested, since the instruments required to do so may not yet be available.⁸⁷ In the final analysis, however, being testable in principle is no more than an acknowledgement that the theory falls into the category of 'scientific' - it says nothing about its validity. The test of a theory must be measured in relation to the 'real' world of actual experience;⁸⁸ if the predicted event occurs, then there is an increased confidence in the hypothesis and the theory, but if the predicted event does not occur, then the theoretical proposition(s) from which the hypothesis was deduced must be re-examined.⁸⁹

The generation of various theories concerning administrative practice was initially advocated by Coladarci and Getzels;⁹⁰ where such theories deal with different aspects of the object of inquiry, the comparative appraisal of these theories rarely arises. However, the demand for 'alternative formulations' and 'competing theoretical frames of reference' entails that there be criteria for adjudicating between them. The demonstration that one theory was better than its competitors lay in the quality of the testable hypotheses that can be formulated and the extent to which the predictions of

one are more accurate than those of the others.⁹¹

The verificationist principle of hypothesis testing became widely accepted⁹² whereby observational statements are proved by induction or confirming instances. There must be more evidence that confirms than disconfirms the statement: given that complete confirmation is difficult, all that is often possible is for researchers to provide confirming instances of the hypothesis.⁹³

An explicit theory of meaning - operationalism - was a strong plank in the positivist programme. The use of operational definitions had its origin in Bridgman's *The Logic of Modern Physics*; "In general, we mean by any concept nothing more than a set of operations: *the concept is synonymous with the corresponding set of operations.*"⁹⁴ Introduced into educational administration by Halpin,⁹⁵ operationalism was understood thus: "(a) concepts are given their meaning by the methods of observation or investigations used to arrive at them, and (b) concepts have no meaning apart from their operations."⁹⁶ Despite reservations by Griffiths,⁹⁷ Hoyle⁹⁸ and Walton⁹⁹ over the adequacy of operationalism and an awareness by Halpin¹⁰⁰ that Bridgman and others had to some extent modified their position on the value of operational definitions, some¹⁰¹ have continued to defend their use in research.

The pre-eminence of science over other forms of inquiry was, and has continued to be, staunchly defended; Griffiths¹⁰² argued that theoretical research could generate new knowledge and he was particularly impressed by the dramatic findings in nuclear physics and astronomy, holding up the discovery of the planet Neptune as a paradigm case. He was convinced that such procedures held true in educational administration as well, concluding that "when administrative theory has been developed comparable to present astronomic theory, it will be possible to build new knowledge in the same manner."¹⁰³ Griffiths¹⁰⁴ acknowledged that theorists in administration, who saw themselves as social scientists, had been greatly influenced by the success of physical scientists; Halpin,¹⁰⁵ in contrast, was scathing of social scientists in educational administration who 'aped' the latter by building highly abstract theories. Only recently was Griffiths¹⁰⁶ moved to ask whether it was possible to develop a scientific theory in the sense of theory in mathematics and physics. His answer was an emphatic 'No', although he did not rule out the possibility of scientific theory in educational administration.

A sharp distinction was also drawn between science and common sense. Although both scientific language and commonsense language are symbolic systems addressing a common world,¹⁰⁷ the former is different from the latter, not only in vocabulary, but more importantly the structure of scientific thought is fundamentally different from the structure of everyday thought;¹⁰⁸ scientific inquiry generates new ways of conceptualizing daily life by defining experience in new terms,¹⁰⁹ is greater in the magnitude of its scope, and is more powerful by its use of a limited number of abstract concepts and generalizations to encompass a greater range of everyday events.¹¹⁰ Not only is scientific language more precise, it also leads to ways of conceptualizing everyday experience which cannot even be thought about in commonsense terms.¹¹¹

That observations of administrative behaviour should be objective was persuasively argued for. Observers should avoid involvement in the events they report in order to ensure objective descriptions; Griffiths¹¹² noted that in much of the research into educational administration there were few reports of events from observers who were not themselves involved in the events being reported. Since such reports were apt to be biased, they were ruled out as unacceptable. Rather, a detached, neutral observer is in the best position to furnish objective descriptions.¹¹³ The object of inquiry, in general terms, was limited to the 'observed behaviour'¹¹⁴ of educational administrators such that "those intuitions, hunches, and feelings which cannot be tested are *not* the subject of a scientific study of administration,"¹¹⁵ a view certainly not accepted by Halpin who, in rejecting a behaviourist point of view, defined behaviour in a broad sense to include "an individual's perceptions, feelings, attitudes, thoughts and verbalizations as well as his overt actions."¹¹⁶

The connection between the theoretical knowledge gained by the researchers and the practical action of the administrators was premised on the is-ought distinction. There was a clear recognition of the importance of the realm of value as the basis for establishing policy about the aims of education,¹¹⁷ determining which administrative course of action best achieved the goals set,¹¹⁸ and providing a moral framework within which an administrator "should be able to apply his scientifically derived insights ethically."¹¹⁹ All of these were beyond the province of research.

The significance of research-based theories and knowledge for the practising administrator was to be found in helping the administrator reflect upon practice. The

development of a 'science of administration' in which educational practice was taken to be equivalent to 'testing educational hypotheses'¹²⁰ was limited to informing the administrator what would happen if a particular course of action were chosen. This took the form of the hypothetical imperative 'if-then'¹²¹ whereby

a theory of administration can be practical only in a limited sense; it can permit us to declare that if you do X, consequence A will result; and if you do Y, consequence B will result but the theory itself cannot give us information on whether consequence A or consequence B is more desirable for a given organization at a given time.¹²²

The role of the researcher was restricted to providing generalized knowledge and empirical principles as the basis for administrators to make predictions about how members of the organization would act, and to anticipate the consequences of various courses of action.¹²³ The researcher in educational administration was primarily concerned with creating knowledge and suggesting how administrators might use it. Thus, the administrator could be seen as analogous to the doctor who is able to utilize theory developed by researchers in biological laboratories; according to Griffiths, what is being suggested is that the educational administrator is an applier of science since "the practice of administration is the application of the theory of administrative researchers."¹²⁴

The action taken by educational administrators was held to be justified if it was predicated on theoretical principles which are themselves logical, rational and explicit, and unwarranted if guided by subjective or anti-rational theory.¹²⁵ For some, the connection between research and practice was tight; Hills¹²⁶ argued that getting research into practice depended on education and administration becoming rationalized in a technical sense as proposed by Parsons:

Action...is rational in so far as there is a scientifically demonstrated probability that the means employed will, within the conditions of the actual situation, bring about or maintain the future state of affairs that the actor anticipates as his end.¹²⁷

It is by this technologization of administration that the researcher and administrator focus on control, for, as Campbell¹²⁸ noted, those who study and those who practice a science of administration have specialized knowledge which is basic to the functioning

of society, and with the growth of an administrative science in an increasingly complex and highly organized society, both, through their particular insights and skills, will come to "exercise greater control in society."¹²⁹

The logical positivism espoused by the founders of the theory movement was part of a wider philosophical picture. If logical positivism, as a movement, came to an end on the eve of World War 2, its philosophical content lived on in the guise of logical empiricism, a transformation which was to have an enormous impact on both philosophy and the sciences, including the social sciences, in the post-war years. The logical empiricists revised and widened the scope of science to encompass all of our knowledge. Thus, their theory of science formed the basis of a general theory of knowledge. Sense data, or observation sentences, provided a certain foundation for science and set down a principle of demarcation between science which would generate true statements about the world and non-science such as values and metaphysics which could not. Linked to the importance of sense data was the verification theory of meaning - the meaning of a sentence is its method of verification. For observation sentences, the meaning lay in the direct empirical observations; for other sentences the meaning of a sentence is given by the empirical observations deduced from the sentence if it were true. Accordingly, theoretical sentences had to be linked to sense data, and for logical empiricists this meant that the meaning of a theoretical expression could be reduced to the definition of an operation which would produce the specified observation. The justification of each item of knowledge rested on it fitting into a logical structure linked to observational evidence. Hypothetico-deduction provided such a justification - hypotheses were to be tested by deducing particular observation sentences which, in conjunction with the initial conditions of an experimental situation, specified an expected observation. If the expected observation eventuated, the hypothesis was confirmed. This logical structure carried with it considerable explanatory power. Something was explained when an instance of it could be deduced from a generalization or law which accounts for the regular occurrence of the phenomenon in question. Because the laws, or law-like generalities, were termed 'nomological' the explanation of a deduced particularity was deemed to be 'deductive-nomological'.¹³⁰

The critique of logical positivism, and its close relative logical empiricism, was

largely driven by subsequent studies into the dynamics, methodology and history of science. Although not unconnected, three important strands of criticism emerged which were to have a devastating impact on logical empiricism in general and on logical positivism in educational administration. One line of argument, associated with the writings of Popper and Quine amongst others, began to unravel, bit by bit, the philosophical assumptions which held the logical empiricist system together. A second counter-attack came from Kuhn whose socio-historical analyses of science undermined the logico-mathematical reconstruction of science set out by the logical empiricists. The third source of criticism against logical empiricism is to be found in the writings of the Frankfurt School. Together, these three philosophical programmes were to seriously weaken logical empiricism to the extent that various post-positivist alternatives were able to take hold in the social sciences and give shape to the theory debate in educational administration.

The critique mounted by Popper¹³¹ and Quine¹³² is primarily an internal one aimed at revising the logical structure and improving the rationality of scientific procedures. They and others accepted that science is a rational endeavour; where they and the logical empiricists parted company was over what makes science rational. Popper rejected the idea that science should be built on the principles of the confirmation of hypotheses. Rather, hypotheses should only be accepted if they are able to resist falsification, and the bolder the hypothesis the more significant it is if it is able to withstand repeated attempts to refute it. However, as Quine contended, falsification is itself problematic. The testing of a hypothesis is never a matter of logic alone since the observation sentence is deduced not from a single hypothesis but from a conjunction of theoretical statements, hence a recalcitrant observation leaves the researcher free to make a pragmatic decision to revise some part of the theoretical system or even reject the observation. The impact of the Quine-Duhem thesis upon the tenets of logical empiricism was considerable. First, the process of inquiry rests on more than logic alone since researchers need to consider background assumptions and make pragmatic adjustments when theory and observation conflict. Scientific rationality is thus far messier than the artificial elegance of logical constructions. Appeal to principles or values must be made to adjudicate between rival empirical explanations. Second, the verification theory of meaning turned out to be untenable. If the empirical sentences

deduced from a theory are the consequences of a theoretical conjunction and never of an individual theoretical sentence, then it follows that a theoretical sentence can never have its own particular empirical consequences. So, the attempt to seek the meaning of an individual theoretical sentence in the definition of a particular empirical operation must fail. Third, the certainty accorded observation sentences proved to be less secure than the logical empiricists allowed. If, on occasions, the most coherent revision required the amendment of observation sentences, then it followed that theoretical considerations may lead to their reformulation. Thus, observation sentences could no longer be seen to be foundational. This insight led others, notably Hanson¹³³, to conclude that since observation is theory-laden and observation terms can be revised in the light of theoretical revision then observation sentences fail to provide the empirical foundation for science. Thus logical empiricism gave way to the internalist challenge.

Kuhn's¹³⁴ account of the structure and dynamics of science stands in marked contrast to the rational reconstructions of science proposed by the logical empiricists and their post-positivist successors. His recognition that the traditional pictures of science failed to square with the history of science led to the conclusion that an adequate conception of science must fit with historical evidence. Accordingly, Kuhn's reconceptualized theory of science acknowledged the importance of the sociological characteristics of the scientific community upon the progression of science through the cyclical pattern of normal science - crisis - revolution - new normal science. Normal science is characterized by a single paradigm consisting of general theoretical assumptions, puzzles to be solved, and techniques of inquiry which are adopted by those scientists working within the paradigm. When confronted with theoretical difficulties and empirical irregularities, a state of crisis sets in which is only resolved when a new paradigm emerges which attracts increasing scientific allegiance until such time as the new paradigm replaces the old. Thus, in this externalist account science is shaped by periodic scientific revolution. Scientists working within a paradigm of normal science seek solutions to puzzles posed by the paradigm. However, a failure to generate a solution to a puzzle merely renders the puzzle an anomaly rather than a refutation of the paradigm. Instead of searching for the falsifying instance, a scientist uncritically accepts the basic tenets of the paradigm and employs all the resources made available by the paradigm to explore the world. The transition from the old

paradigm to the new is marked by serious anomalies generating professional uncertainty amongst scientists. Because of the incommensurability of the two competing paradigms, a switch of allegiance from one to the other will be governed less by logical argument and rational justification than by a variety of considerations including political, religious and economic reasons. In short, why a paradigm shift occurs is to be explained largely by psycho-social investigation into what caused scientists to change paradigms.

Does science, on Kuhn's account, progress? Because of his claim that rival paradigms are incommensurable, Kuhn is often interpreted as advocating a relativist position. In one sense he is not. Within a paradigm of normal science progress is usually made in solving puzzles even if anomalies arise. The bigger question is whether science itself progresses - is the replacing paradigm better than the replaced paradigm? Insofar as the new paradigm solves problems which were unresolvable within the old, then Kuhn is no relativist: "Later scientific theories are better than earlier ones for solving puzzles in the quite different environments to which they are applied. This is not a relativist's position, and it displays the sense in which I am a convinced believer in scientific progress."¹³⁵ However, science is unable to get closer and closer to the truth about the world.

The critique of positivism mounted by the Frankfurt School represents a third strike against the empiricist theory of science. The critical theory of society developed by the pre-World War 2 members of the Frankfurt School drew on the legacy of German idealism, especially in its Hegelian form. Hegel's system of philosophy elevated speculative metaphysics to its highest level ('Spirit' and 'Absolute Knowledge') which gave rise to two contrary reactions. Marx and the Young Hegelians mounted a revolution against Hegelian idealism from within, and this constructive debate with metaphysics was carried over into the Frankfurt School of critical theory. Positivists, particularly the early logical positivists, took issue not just with Hegelian thought but with any philosophy which embraced metaphysics. Accordingly, the logical positivist's use of Okham's razor to cut metaphysics adrift from philosophy by restricting philosophy to the logico-empirical sciences provoked a robust response by critical theorists. Because critical theorists¹³⁶ took metaphysics to be meaningful, their arguments against logical positivism were directed at showing how the latter's rejection of metaphysics as

meaningless so impoverished philosophy that it failed to furnish anything like an adequate theory of knowledge and human existence.

The Frankfurt School's criticism of positivism in all its guises rested on the former's stress on the objective conditions of knowing in contrast to the latter's emphasis on the objectification of knowledge. Positivism undermined the relation between the socially-located knower and what is known: positivism thus " 'shifts the source of certainty from the subject of thought to the subject of perception' whereby 'the spontaneous functions of thought recede while its receptive and passive functions gain prominence'."¹³⁷ If epistemology is to flourish then the knowing subject must occupy a central place in philosophy: according to Horkheimer,

the 'given' is not, in this case, something that exists generally and independently of theory. Rather, it is mediated through the conceptual whole in which such statements function. This does not, however, deny that the reality aimed at by the theory is fully substantial, that is, that it exists independently of the consciousness of the theoretician.¹³⁸

For critical theorists, positivist philosophy takes on a distinctly technical character leading to a form of alienated consciousness. By turning its back on the central problems of human creativity within the context of the material conditions of modern social life, positivism 'froze' or eternalized contemporary social and political circumstances. By eliminating metaphysics and reducing the study of social life to that of the natural sciences, positivism mystified social life by looking at it in a mantle of scientific 'objectivity' and passive thought. Positivism, by accepting the existence of 'facts' which can be 'objectively known', codifies existing social relations and separates social facts from their concrete location of class struggle.

In the social sciences, the most insidious consequence of this position has been the acceptance of the 'myth' of value freedom. By accepting that the scholar can separate himself from his surrounding social context and achieve objective knowledge by use of reason alone, positivism denies the revolutionary and liberating role of knowledge. The intellectual is committed to saying how things are but not to showing what they might be.¹³⁹

Because, from a critical theory perspective, positivism assumes that neutral knowledge is possible, it contributes to the alienation of consciousness in modern society. But if knowledge is connected to human interests then positivist philosophy fails to address one of the most important problems in epistemology. Habermas¹⁴⁰, in his *Knowledge and Human Interests*, set out to show how all knowledge is linked to three cognitive interests - technical, hermeneutic and emancipatory. The positivist programme to limit knowledge to the realm of science is weakened by Habermas's re-introduction of the nature/reason distinction. While the natural sciences ('empirical/analytic sciences') seek technical control of nature the hermeneutic disciplines provide a deeper understanding of such subjective and intersubjective factors as people's beliefs and intentions. Emancipation endeavours to free us from constraint, especially ideological 'false consciousness' to which positivist philosophy contributes.

Logical positivism and its rival theories have all had a significant impact on philosophy and the social sciences. Their influence has been widely felt in educational studies, particularly educational administration. The philosophy of logical positivism was adopted by those in the theory movement, notably Griffiths and Halpin, and gained widespread dissemination. Kuhn's ideas struck a chord with Greenfield in particular whose outlook on science and inquiry was decidedly antipositivist and supportive of an interpretive paradigm; the writings of the Frankfurt School theorists, especially Habermas's, were to shape a distinctive version of critical theory promoted by Bates and Foster; and Quine's work had special significance in the more recent emergence of Evers and Lakomski's naturalized philosophy. Each of these philosophical positions will be considered in turn, beginning with logical positivism and then its rivals in the order of their appearance in educational administration.

Although the logical positivism of the theory movement was an improvement on its naive empiricist predecessor, it nonetheless contained a number of ideas which were duly challenged by those who came to the realization that these assumptions could not do the work expected of them. Questions were asked: is there a real world which exists independently of us and is this world really knowable as it is? If not, then how can we hold to a correspondence theory of truth? As systems, do organizations have an objective existence quite apart from the people who are their members? Is there a generalized form of administration which can be understood in structural-functional

terms? Should inquiry be limited to that characterized by hypothetico-deduction, operational definitions, verification, detached observation, and the like? Is it really possible to separate the is from the ought? Can a science of administration avoid matters of value? In short, is a science of administration possible? There were some in educational administration research who began to answer 'no' to these questions. So it was that a phenomenological alternative to logical positivism and a science of administration eventually emerged, at about the same time as the tide turned in the wider social sciences as positivist thought was confronted by interpretive inquiry.

NOTES

- 1 Common philosophical labels attached to this position include 'naive empiricism' and 'naive inductivism'.
- 2 Graff & Street, 1957, 138.
- 3 Rice, 1902, 117.
- 4 Culbertson, 1987a, 10.
- 5 Halpin, 1957, 197. A similar view was offered by Griffiths (1965, 34):
 Most studies in educational administration are done at the level of 'naked empiricism'. By this we mean that the researcher has an idea that a vaguely defined problem needs to be solved. He collects data...and attempts to find an answer by 'looking at the data'. By following this procedure we have amassed tons of data, but have come up with very few answers.
- 6 Cohen, 1931, 76. Quoted by Coladarci & Getzels (1955, 7), Getzels, et. al., (1968, 7) and Griffiths (1957, 363; 1959, 25).
- 7 Getzels, et. al., 1968, 7.
- 8 For more detailed accounts of logical positivism and its influence on educational administration, see Culbertson (1981a, b, 1983). Willower (1986a, 39) claims that no one currently writing on philosophical issues in educational administration subscribes to logical positivism since the position is philosophically unfashionable. This may be so, but many researchers and theorists are still swayed by what Giroux (1979) calls the 'culture of positivism'.
- 9 A minor dispute has arisen over whether Feigl was a logical positivist at the time when his later ideas were taken up by educational administrators. Many writers in educational administration either label him as such (Griffiths, 1983, 203) or equate Feigl's (1947) logical empiricism with logical positivism (Willower, 1980, 10). Both Corson (1987, 23) and Evers (1987a, 59-62) note that Feigl rejected logical positivism in favour of logical empiricism. Feigl was an empirical realist who adopted Popper's (1959) falsificationism whilst the Vienna Circle positivists supported a verificationist, anti-realist position. The substantial evidence presented by Evers is sufficiently strong to conclude that those who did, and continue to, call Feigl a logical positivist are in error.
- 10 Culbertson, 1981a, 40.
- 11 Feigl, 1951.
- 12 Simon, 1957. The influence of logical positivism on the theory movement in

educational administration via the writings of Simon has been traced out by Culbertson (1988). The members of the Vienna Circle departed from Austria near the start of World War 2, many of whom settled in the United States. Psychologists, including Hull and Lewin, were attracted to the philosophy of logical positivism, as were various sociologists, particularly Merton. But it was Simon's (1957) *Administrative Behaviour* which was to have a marked impact on the early thinkers in the theory movement. According to Culbertson (1988, 15) Simon's work "provided the most direct conduit in the 1940s for the flow of 'administrative science' into educational administration." Simon advocated a behaviourally orientated scientific approach to organizations in his reconstruction of administrative theory. He stressed a science of administration founded on the behavioural sciences and was primarily concerned with decision-making and the extent to which rationality could achieve the most 'satisficing' outcome rather than the best one. On the logical positivist assumption that ethical statements are without meaning insofar as they are unverifiable, then the only statements that can be demonstrated to be true are those of either a logical or an empirical nature. Since, according to Simon, science is only concerned with facts, a science of administration can only consist of factual content. Foster (1988, 45) summarizes Simon's position thus:

Administration can be a science equivalent to any natural science.

An administrative science is based on logical positivism.

An administrative science is value-free and objective.

An administrative science is concerned with the study of correct decisions and the process of making correct decisions.

For an administrative science, rationality is defined as the selection of means towards achieving ends.

The ends to be achieved are not a matter of concern for the administrative scientist, but are set by policy-making bodies.

These assumptions were enthusiastically adopted by the founders of the theory movement and were rapidly disseminated by Getzels (1952), Griffiths (1957, 1958, 1959) and Halpin (1957, 1958a, b) to the wider educational administration community.

- 13 The explanation as to why the advocates of logical positivism in educational administration had such a narrow understanding of the philosophy they embraced is perhaps to be found in Simon's (1957, 45) claim that to ground an answer...on first principles would require that this volume on administration be prefaced by an even longer philosophical treatise. The necessary ideas are already accessible in the literature of philosophy. Hence, the conclusions reached by a popular school of modern philosophy - logical positivism - will be accepted as a starting point.

The basic references acknowledged by Simon include Ayer (1936) and Carnap (1937-8), both of which were published some twenty years prior to Simon's work. It is unfortunate that neither Simon nor those in educational administration took into account the barrage of criticism against logical positivism in the philosophical literature.

- 14 Campbell, 1964, 301; Coladarci & Getzels, 1955, 13; Walton, 1969, 11.
- 15 Hills, 1980, 26.
- 16 Griffiths, 1957, 363.
- 17 Halpin, 1958b, 17.
- 18 Halpin, 1963, 313.
- 19 Hills, 1975, 117.
- 20 Hoy, 1978, 3.
- 21 Walton, 1969, 7.
- 22 Hills, 1977, 2.
- 23 Hills, 1980, 27.
- 24 Griffiths, 1957, 363.
- 25 Halpin, 1963, 313.
- 26 Halpin, 1958b, 8.
- 27 Griffiths, 1963b, 125.
- 28 Halpin, 1963, 313.
- 29 Coladarci & Getzels, 1955, 13.
- 30 Campbell, 1964, 301.
- 31 Willower, 1979a, 65. Walton (1969, 204), in considering how the propositions of a theory conform to reality, concluded that "some of the propositions are fairly amenable to determining their direct relationship to the observable world," while Griffiths (1975, 17) suggested that "while a theory does not need to correspond to reality to be useful, when given two viewpoints of reality it is more heuristic to choose one that does correspond more closely."
- 32 Griffiths, 1957, 361 & 366.
- 33 Griffiths, 1959a, 22.
- 34 Halpin, 1958b, 6.
- 35 Griffiths, 1959a, 17. To illustrate his argument with a practical example, Griffiths (1959a, 16) quotes Simon's (1957, 249-50) exemplar:
 In the realm of economics, the proposition 'Alternative A is *good*' may be translated into two propositions, one of them ethical, the other factual:

'Alternative A will lead to maximum profit.'

'To maximize profit is good.'

The first of these two sentences has no ethical content, and is a sentence of the practical science of business. The second sentence is an ethical imperative, and has no place in science.

36 Griffiths (1959a, 17) was convinced of the logical positivist position that social life lends itself to scientific study in the same manner as does the natural world, so long as the *is* and the *ought* are kept distinct. The place of values in educational administration theory adopted by Griffiths was that advocated by Thompson (1958, 31):

The values capable of being attached to education and to administration will not be incorporated into the theoretical system itself; rather the system will treat such values as variables.

37 Griffiths, 1964c, 135.

38 Getzels, 1958, 1960; Griffiths, 1959a, 1963b; Hoy & Miskel, 1982. However, for a recent critical analysis of systems theory see Lakomski & Haynes (1994).

39 Hills, 1982, 38.

40 Griffiths, 1963b, 129.

41 Griffiths, 1963b, 130. Later, Griffiths (1985a, 4) was to reject this concept of 'system'. With reference to another paper (Griffiths, 1964b), he wrote "nowhere in my chapter is there a contention that an organization *is* a system."

42 Getzels, 1958, 152. For a detailed examination of the progressive reformulations of Getzels' initial model, and a defence of his work, see Lipham (1988).

43 Getzels, et. al., 1968, 57.

44 Getzels, 1960, 54.

45 Getzels, et. al., 1968, 57.

46 Hills, 1975a, 138.

47 Hills, 1975d, 6.

48 Hills, 1975a, 113.

49 Hills, 1975d, 7.

50 Hills, 1982, 39-41. For a more technical debate over Hills' thesis see Hills (1982, 1983) and Willower (1980, 1983a).

51 Corwin, et. al., 1975, 96.

52 Hoy, 1982, 3.

53 Hoyle, 1976, 5-6.

- 54 Corwin, et. al., 1975, 96.
- 55 Griffiths, 1959a, 25.
- 56 Lazarsfeld, 1963, 7.
- 57 Getzels, 1952, 236.
- 58 Griffiths, 1959a, 72-3.
- 59 Griffiths, 1959a, 71.
- 60 Halpin, 1957, 160.
- 61 Walton, 1959, 35.
- 62 Campbell, 1958, 175.
- 63 Graff & Street, 1957, 120-1.
- 64 Hall, 1963, 25.
- 65 Halpin, 1958b, 10.
- 66 Walton, 1970, 14-5.
- 67 Griffiths, 1979a, 48.
- 68 Campbell, 1958, 1986.
- 69 Griffiths, 1985c, 7.
- 70 Getzels, 1952, 235.
- 71 Griffiths, 1959a, 22; Hall, 1963, 30.
- 72 Coladarci & Getzels, 1955, 4.
- 73 Griffiths, 1957, 359.
- 74 Halpin, 1957, 156.
- 75 Halpin, 1958b, 7.
- 76 Feigl, 1951, 182.
- 77 Griffiths, 1959a, 28; 1964b, 98; 1965, 34; 1975, 15, 1977a, 9.
- 78 Hoy, 1978, 1; Hoy & Miskel, 1982, 20; Lazarsfeld, 1963, 15; Walker, 1965, 20.
- 79 Crane & Walker, 1976, 2; Hills, 1963, 482; Schwab, 1964, 56; Trow, 1959, 125; Walker, 1978, 99; Willower, 1975b, 78.
- 80 Griffiths, 1959a, 22.
- 81 Coladarci & Getzels, 1955, 5.
- 82 Corwin, et. al., 1975, 81.
- 83 Getzels, 1958, 152.
- 84 Charters, 1977, 374.

- 85 Campbell, et. al., 1960, 177.
- 86 Griffiths, 1957, 357; Hoy & Miskel, 1982, 20; Hoyle, 1976, 5; Walker, 1965, 20.
- 87 Griffiths, 1964b, 100-1.
- 88 Halpin, 1958, 11; Walton, 1969, 203.
- 89 Coladarci & Getzels, 1955, 4.
- 90 Coladarci & Getzels, 1955, 26.
- 91 Halpin, 1957, 197.
- 92 Griffiths, 1965, 35; Hills, 1975a, 117; Hoy, 1978, 5; Walker, 1965, 21; Walton, 1969, 25.
- 93 Corwin, et. al., 1975, 79.
- 94 Bridgman, 1927, 5.
- 95 Halpin, 1957, 156.
- 96 Griffiths, 1964b, 106.
- 97 Griffiths, 1964b, 106; 1985b, 5.
- 98 Hoyle, 1969, 37.
- 99 Walton, 1969, 13.
- 100 Halpin, 1963, 313-4.
- 101 Willower, 1979b, 33; 1980, 10; 1982. 11-2; 1985b, 11.
- 102 Griffiths, 1957, 166-7.
- 103 Griffiths, 1957, 367. Expanding slightly on this, Griffiths (1957, 388) declared that:
the great task of science has been to impose an order upon the universe. Kepler's law, for instance, imposes a set of relationships upon the planets of the solar system. Within this formulation of laws, the motions of the planets make sense, their position can be predicted, and order is apparent to all who care to look for it. This is the great task of theory in the field of educational administration....It is true that we in educational administration are away from a complete theory of administrative behaviour, but we are moving in the right direction.
- 104 Griffiths, 1964b, 95.
- 105 Halpin, 1960, 286.
- 106 Griffiths, 1985c, 7.
- 107 Hills, 1975a, 115.
- 108 Halpin, 1962, 331.

- 109 Halpin, 1963, 314.
- 110 Griffiths, 1959a, 23.
- 111 Hills, 1975a, 122. Reversing his earlier stand, Griffiths (1977a, 7) called for the dropping of abstract concepts to describe administrator behaviour, holding that such descriptions should be couched "in terms of ordinary experience expressed in ordinary language" (Griffiths, 1979a, 43).
- 112 Griffiths, 1957, 361.
- 113 Halpin (1963, 318-9) was later to question the concept of objectivity, pointing out that the effort to reduce subjectivity is futile since scientific detachment is impossible. Following Polanyi (1958), Halpin argued that observation, as an act of comprehension, entails a change in the person carrying out the observation.
- 114 Getzels, 1958, 152.
- 115 Griffiths, 1959a, 22.
- 116 Halpin, 1957, 161.
- 117 Campbell, 1964, 301.
- 118 Griffiths, 1957, 365-6.
- 119 Campbell, 1964, 301.
- 120 Coladarci & Getzels, 1955, 27.
- 121 Griffiths, 1959a, 25.
- 122 Halpin, 1958, 9.
- 123 Cunningham, et. al., 1963, 99.
- 124 Griffiths, 1959a, 24.
- 125 Hoy & Miskel, 1982, 28.
- 126 Hills, 1967, 27.
- 127 Parsons, 1937, 699.
- 128 Campbell, 1964, 299.
- 129 Campbell, 1964, 300.
- 130 Churchland, 1986, 253-258
- 131 Popper, 1959.
- 132 Quine, 1960.
- 133 Hanson, 1967.
- 134 Kuhn, 1970.
- 135 kuhn, 1970, 206.

- 136 Horkheimer & Adorno, 1973; Habermas, 1971.
- 137 Slater, 1977, 51.
- 138 Slater, 1977, 51.
- 139 Anderson, Hughes & Sharrock, 1986, 46-7.
- 140 Habermas, 1971.

CHAPTER THREE

PHILOSOPHICAL TRADITIONS OF RESEARCH INTO EDUCATIONAL ADMINISTRATION (2): PHENOMENOLOGY

After some twenty years of the theory movement, Willower¹ felt confident to assert that the ascendancy of a more scientific approach in educational administration represented a maturing of the field with little likelihood of any significant change taking place. There had been no serious epistemological debate nor had any alternatives emerged to challenge the scientific-empirical theory of knowledge which underpinned research into educational administration. However, Willower, like many others, had failed to notice the slow evolution of a competing tradition of philosophical thought which was to finally explode upon the academic scene in the mid-1970s. The resulting epistemological debate was to change the direction of thinking in educational administration in a radical and revitalizing way as the proponents of phenomenology launched a sustained attack on positivist research.

PHENOMENOLOGY

Although the philosophical tradition under discussion might more correctly be called 'Interpretivism' as an encompassing descriptor, historically the term 'Phenomenology'² came to be applied to the position so that today many of those in educational administration who adhere to the interpretivist approach refer to their work as either 'phenomenological'³ or as some variant of this - 'hermeneutic',⁴ 'hermeneutic phenomenology',⁵ 'subjectivist'⁶ or 'qualitative'.⁷ Regardless of the diverging emphases picked out by these various terms, those writing in the phenomenological tradition (as it will be referred to hereafter) still share a common set of assumptions which stand in sharp contrast to those of logical positivism.

The phenomenologists espouse a metaphysical vision of reality which could be called 'ideal realism':⁸ this view has its genesis in the distinction drawn by Kant⁹ between the noumenal world (the world as it is) and the phenomenal world (the world as we

perceive it). The noumenal world can never be directly perceived; rather, "reality is always glossed over with human interpretations which themselves become the realities to which man responds."¹⁰

Likewise, a sharp distinction is drawn between the physical and social worlds.¹¹ The existence of an objective material reality having ontological independence is not denied;¹² as Greenfield acknowledged, there are "the hard objects of the physical world,"¹³ and there is something 'out there' which contains forces that man does not control - no individual can bring about their own birth nor withstand death.¹⁴ Furthermore, there are other people (physical entities) who exist, many of whom are beyond our control.¹⁵ In contrast, the social world has no ontologically independent existence. Rather, it is constructed from and limited by human action:¹⁶ it is a social invention "created in the minds of persons."¹⁷

Yet, however the physical and the social worlds are constituted, they are not directly knowable. The 'objective' world 'in itself' is forever beyond our immediate apprehension. Reality is no more than that which we perceive to be real. Since our perceptions of the world are mediated through our conceptual understandings, we are unable to see, hear or feel anything without first having theoretical ideas with which to give meaning to our experience. As "social reality may be construed as images in the mind having no necessary or inevitable forms except as man creates them,"¹⁸ what is real depends on the assumptions we hold about reality and the way we want to look at it.¹⁹ Given the 'social construction of reality'²⁰ which can only be perceived and understood subjectively,²¹ it follows that since there are no fixed ways of construing the social world, let alone there being one 'correct' image of the world, we are left with multiple realities,²² none of which can be judged to be objectively true or false,²³ or as Greenfield so forcefully put it: "We live in separate realities. What is true for one person is not for another. In that sense we live in different worlds."²⁴

Knowledge of the social world rests on the Kantian thesis which collapses the distinction between the knower and the known, placing the emphasis on the process of knowing rather than on the object known. Knowing, therefore, is a dialectic process by which the symbol and that symbolized are brought into a unified relationship.²⁵ If the knower and the known blend together then there can be no objective truth criteria to assess whether our theories about the world are true or false, for there are no

independent 'empirical facts' against which competing realities can be judged since our theories create the very facts that are thought to provide such criteria.²⁶ Truth, then, is internal to our theories about the world. Truth in the academic world of inquiry is no different from that of the everyday world - "truth is what scientists agree on or what the right scientists agree on. It is also what they can get others to believe in."²⁷ Therefore, we are engaged in a 'truth-making'²⁸ rather than a 'truth-seeking' activity, where nothing can be done to validate our perceptions of reality but to describe them and argue for their truth.²⁹ In addition, no sharp distinction can be drawn between social reality, our theories about social reality and ourselves, since not only are our theories as much inventions of social reality as they are explanations of it but we ourselves are also part of the social reality about which we as theorists not only speculate about but also create.³⁰

In the social world, facts and values are logically distinct and mutually exclusive categories. There is, argues Hodgkinson,³¹ no causal relation between the two - facts cannot yield a value, and the only value possessed by facts is that given them by people. As a consequence, factual propositions can only be assessed true or false while value propositions must be judged right or wrong, good or bad.³² Nevertheless, facts and values are 'inextricably interwoven';³³ our values may determine the facts we discover while such facts may lead us to change our values,³⁴ and both are constitutive of human action.³⁵ Organizations provide a context for such action. From a phenomenological point of view, organizations are non-natural entities having neither corporeal³⁶ nor ontological³⁷ existence.

This is not to deny that organizations may have associated physical properties,³⁸ involve buildings, and may be subject to physical and technological phenomena³⁹ such as weather and computers. But these do not in any way constitute an organization. Rather, organizations are man-made, being conceived of as 'social inventions',⁴⁰ 'patterns of human social relationships',⁴¹ 'cultural artifacts'⁴² or 'contrived social entities'.⁴³ Organizations exist in, and are manifestations of, the minds of those who create and maintain them;⁴⁴ they are grounded in the meanings, intentions, actions and experience of those who constitute them.⁴⁵

Organizations come into being when two or more persons form a collectivity in order to achieve certain purposes, the realization of which requires the adoption of particular courses of action which give rise to a structured pattern of status-

differentiated interaction.⁴⁶ Once formed, an organization may appear to be more powerful than those who create it, with members responding to the organization as if it were something other than a human invention.⁴⁷ In large part, this can be attributed to the 'relative immortality' of the organization which transcends the entries and exits of members by way of the transmission of symbolic life across shifts in membership.⁴⁸ However, the belief in a natural, independently existing entity with a life of its own comes at a price, namely, the dehumanization of an essentially human creation.⁴⁹

Although an organization might appear to be 'objective' insofar as some of its key features are generally agreed upon, in essence the organization is subjectively nothing more than the multiplicity of individual perceptions of it.⁵⁰ Because each member has different experiences of the organization, each accordingly belongs to a different organization since experiences of the 'same' are different,⁵¹ such that "two people working in the same school may well attend two irreconcilable institutions."⁵²

Organizations have structure, but to think that structure is natural is to commit the 'naturalistic fallacy' for which phenomenology provides a useful antidote.⁵³ Structure is not a separate entity which can be imposed on an organization.⁵⁴ Nor can it be likened to that of a house where the tenants may come and go but the basic structure remains unchanged, shaping the behaviour of those within.⁵⁵ Rather, organizational structure is nothing more than the characteristically patterned behaviour of those who are members of the organization.⁵⁶ Such behaviour is largely shaped by their beliefs and actions; as a consequence there is no single organizational structure nor does structure have a uniform effect on members.⁵⁷ Organizations, then, derive their nature not from an essential, pre-existing structure but from the beliefs, experiences and actions of the participants: "people do not exist in organizations, organizations exist in and through individuals."⁵⁸ At the pragmatic level, organizations appear to have goals apart from those of the members, such that individuals may deny these goals to their disadvantage or peril.⁵⁹

However, the very idea that organizations have goals, purposes or other such features of consciousness is rejected; it is the members of organizations who have goals and purposes, not the organization itself.⁶⁰ Organizations serve member's purposes, these being the objectives individuals pursue for personal ends,⁶¹ while reference to the 'goals of the organization' means nothing more than the

preoccupations and interests of the dominant group(s).⁶²

What the members and administrators of an educational organization *do* consists of a continuous series of acts over time contextually governed by retrospective and prospective conduct in which "the past reveals itself in its present which serves as the incubator of the future."⁶³ Human action has two constitutive elements, neither of which can be sharply separated, but which are joined in a dialectic synthesis.⁶⁴ Each act has physical properties (signs which are objective) and interpretive meaning (symbols which are subjective);⁶⁵ since the physical event is intentional while meaning is shaped by behaviour, any marked distinction between the two is in error for members concomitantly act and create meaning. Nevertheless, the symbolic element is the primary component of the action.⁶⁶ Whatever physical events may occur - movements of bodies, wind across vocal chords - these may have quite different meanings for the agent and the various participants.⁶⁷ The one physical event can have multiple meanings, and vice versa. As Levine et. al. point out with reference to a category of acts, namely speech acts, "the same objectively observed or enacted linguistic behaviour (spoken series of words) can, therefore, constitute different speech acts in different environments, and the same speech act can be invoked through many different linguistic acts."⁶⁸ Furthermore, while members may act purposefully, they can nevertheless bring about consequences to themselves and others which were not intended.⁶⁹

Whatever else they might be, organizations, especially educational organizations, are moral entities. Hodgkinson⁷⁰ argues that all human behaviour is value-laden by virtue of the fact that it is motivated - what members of an organization do rests on a conviction that what they do is right,⁷¹ in that decisions about what one ought to do are unlikely to be made on the basis of facts alone but rather from within a "frame of values in which to assess the facts."⁷² In addition, since education is a deeply moral enterprise, then its organization and administration must also be a moral enterprise.⁷³ It is an enormous mistake to think of educational administration as anything else, for if morality is conceptualized as having a concern for others, then it may be concluded that educational administration is a particularly ethical activity.⁷⁴

A clearly defined concept of administration emerges from the phenomenological analysis of organization. Administration is a category of human social action extending

over lengthy periods of time in order to achieve certain socially legitimized ends; in the case of educational organizations, the end is the education of members of society. Administration of the organization is designed to keep the organization 'on track' in relation to the specific purposes set out for the institution. Although administration has a maintenance function, unlike the structural-functionalist perspective such maintenance may involve radical departures in purpose specifications and procedures.⁷⁵ Hodgkinson,⁷⁶ adopting the is-ought dichotomy, draws a distinction between administration and management; the former is ends-oriented being concerned with the formulation of purposes, policy and value issues with an emphasis on influencing others to achieve them ('philosophy in action'), while the latter, being means-oriented, encompasses the more routine methods employed to accomplish the ends. Regardless of the type of organization, there is, claims Hodgkinson,⁷⁷ a generalized form of administration cum management activity across organizational settings characterized by a class of acts unrestricted by the essential nature of any particular organizational type.

Power lies at the very heart of organizational and administrative processes.⁷⁸ Where the meanings, purposes and actions of the members of an organization coincide, few problems arise, but where these are incompatible, considerable difficulties can ensue. Multiple realities mean that people will seek to impose their visions upon others and attempt to gain control of organizational resources (money, materials, technology and symbolic honours) in order to do so.⁷⁹ Power is embedded in the relationships which obtain between members of the organization; because some people have more power than others, they are not only better able to impose their beliefs on others and legitimate them as valid, they are also able to achieve ends through the compliance of others to act in accordance with their wishes, however these may be framed.⁸⁰ The exercise of power in the administration of educational organizations is largely through language - those who control language thereby control thought, and the actions of others.⁸¹

Research into the administration of educational organizations is grounded in a highly distinctive set of basic assumptions, the most fundamental being that since a sharp distinction must be drawn between physical and social phenomena, a corresponding demarcation must also hold between the study of physical reality and

inquiry into the social world. Whereas material entities are relatively devoid of social meaning and are amenable to investigation by the procedures of traditional scientific method, the human world is composed of meaning embedded in consciousness which can only be understood through hermeneutic interpretation.⁸²

In social inquiry, an ordered hierarchy is apparent: at the base is to be found the realm of 'social facts' or 'brute data' consisting of the physical and biological circumstances relevant to organizational experience, along with such matters as salaries, costs of materials and demographic descriptions of members of the organization. There does appear to be some agreement that while such basic data can be examined using quasi-scientific means,⁸³ social inquiry must go beyond this to understand meaningful action. Such data need to be interpreted in the light of how they are understood, the significance attached to them, and their contribution to how and why the participants act as they do. This necessitates a higher and more sophisticated level of analysis.⁸⁴

Since it is impossible to penetrate through subjective social perceptions to reach objective social reality, researchers have no alternative but to begin their inquiries by focusing on the mental life of those whom they investigate.⁸⁵ This entails concentration on states of mind with an emphasis, firstly, on the 'consciousness',⁸⁶ 'meanings',⁸⁷ 'understandings'⁸⁸ and 'interpretations'⁸⁹ the members have of the organization and its administration, and secondly, on the 'motivations',⁹⁰ 'purposes',⁹¹ 'intentions'⁹² and 'willfulness'⁹³ of administrative action. Gronn, following Ryle,⁹⁴ argues that the researcher must go beyond the mere 'thin' descriptions of what administrators visibly appear to do by providing a 'thick' description of the agent's actions by reference to "what the person concerned *had in mind*."⁹⁵ Thick description seeks to explain behaviour in terms of the administrators' norms, values and motivations as these govern their conduct.⁹⁶

Because the researcher is epistemologically bound by the same rules and limitations as the administrators whose practices are the subject of inquiry,⁹⁷ any theoretical explanations which the former may construct must be grounded in and derived from the observational data of organizational settings.⁹⁸ On this account, "theory thus becomes the sets of meanings which yield insight and understanding of peoples' behaviour. These theories are likely to be as diverse as the sets of meanings

and understandings which they are to explain."⁹⁹ Any theoretical explanation of administrative behaviour must therefore be couched in terms meaningful to the actors involved (the theory must make sense to them) rather than according to what makes sense to the researcher.¹⁰⁰

The investigation of administrator behaviour must focus on the meanings attached to human conduct, both physical and verbal. Although explanations of what administrators bodily do remains important, increasing emphasis has recently been placed on the analysis of language in administrative contexts.¹⁰¹ Although verbal behaviour forms but a part of the administrator's conduct, it is nonetheless a dominant activity which is not only influenced by but is also uninterpretable in isolation from its organizational context. Levine, et. al.¹⁰² argue that it is not the words themselves that are important but, following Searle,¹⁰³ that speech acts embody meaning which is essentially rule-governed. These rules can be known since they are manifested in and distinguished by their communicative functions (promise, warn, state, command, etc.).

Whether the concern is with physical or verbal behaviour, the central issue is the meaning which underpins any particular act (or series of acts). Yet the meaning of 'meaning' is, as Gronn¹⁰⁴ and Ribbins, et. al.¹⁰⁵ acknowledge, in need of clarification. Meanings are not directly observable as are material entities but must be inferred from what administrators say and do. Since more than one meaning can be attached to an action, the notion of 'the' meaning of an act is fallacious. Further, the important meanings of an act may, on occasions, be located in the reactions of others rather than in the intentions and motives of the actor.

Although Greenfield¹⁰⁶ argues that intentionality is the key to understanding organizations and their administration, others,¹⁰⁷ recognizing the difficulty of establishing what the agent's intentions are, recommend that the researcher ask the actors what their reasons, motives, intentions and so on are. Yet, as Greenfield¹⁰⁸ also points out, people are able to hide these not only from others but also from themselves as well. Finally, while much of what administrators do is intended, their conduct may in some circumstances result in unintended consequences. Accordingly, the explanation of meaning must be 'causally adequate'¹⁰⁹ in order to reveal how people's constructions of their social circumstances have consequences for themselves and others: "To understand organizations requires that we understand how intention becomes action

and how one person's intention and action triggers intention and action in others."¹¹⁰ Nevertheless, no explicit theory is evident in the phenomenological literature to explain the postulated causal mechanism between intention and action.

If we live in subjective realities such that various members of the same organization inhabit different worlds, how is it possible for researchers ever to understand the viewpoints and actions of those they investigate? Greenfield¹¹¹ suggests that it is possible to mediate between sets of subjective meanings in a way analagous to the translation from one language to another, namely, by hermeneutic analysis. This entails a process of circularity (the hermeneutic circle) whereby the interpretation of a beginning text of meanings and actions poses further hermeneutic tasks of interpretation, so that the original ideas are returned to and re-examined in the light of further interpretation.¹¹² This avoids being bound by the preconceived notions of the investigator by allowing for the reformulation of the problem as the researcher proceeds, as well as permitting a reconsideration of what data is or is not relevant to the interpretation.¹¹³ Methodologically, phenomenological inquiry is categorically similar to both the general areas of psychology and psychiatry, especially psycho-analysis and psychotherapy,¹¹⁴ and to the arts, particularly biographies, histories, literary criticism, aesthetic appreciation and philosophical analysis.¹¹⁵ Of central concern is the achievement of understanding, or in Weber's terms 'verstehen',¹¹⁶ whereby the researcher seeks to 'enter the mind' of those being researched in order to take their viewpoint and grasp the nature of their subjective experience.¹¹⁷

Can observations of administrative behaviour be objective? Yes, but only if the concept of 'objectivity' is redefined. The very idea that researchers can be neutral and unbiased in their observations is rejected,¹¹⁸ to be replaced by an awareness that the categories employed by the researcher to describe and explain the actors' behaviour are themselves subjectively chosen. Researchers bring to their inquiry their own particular interests, attitudes, values and beliefs, and they cannot escape from the fact that their own interpretations act as filters in their understanding of other people's experience.¹¹⁹ Since there is always some form of interactive relationship, and often dialogue, between the researcher and those being researched, neither can expect to emerge unscathed from their mutual experience.¹²⁰ For the phenomenologist, the point of the interaction is to engage in 'revolutionary moral discourse'¹²¹ directed at achieving

'self-understanding'.¹²² Thus, objectivity and subjectivity are mutually dependent categories. The exact nature of the relationship is problematic for phenomenologists. Gray suggests that "objectivity is the understanding or meaning an experience has for another person in his terms, not one's own interpretation of the same experience":¹²³ others, mindful of the danger of the "solipsistic reification of the actors' accounts",¹²⁴ acknowledge that inquiry requires some initiative from the researcher to provide an assessment of the actor's interpretations based on more than the actor's own subjectivity. At this point the question of the validity of interpretations arises.

Gibson¹²⁵ asks, whose texts or interpretations are to be ascribed legitimacy? The ambiguity of the question is evident in the two very different types of answers which have been given. The sociological answer is that legitimacy resides in power. Given the multiple versions of reality held by the members of an educational organization, these can be mapped out and the pressures which threaten them can be discovered.¹²⁶ The connection between images of reality and organizational power is to be found in the ways those advocating the dominant views use the advantage of their position to achieve ideological legitimacy.¹²⁷ Since certain people in an organization have the power to force their meanings on others, legitimacy may represent nothing more than the vested interests of those who control the organization.¹²⁸ However, the dominant or 'legitimate' views are neither 'natural' nor 'necessary', but are held in place through the exercise of power. As a consequence they may be rejected and replaced with other ideologies as a result of shifts in the distribution of power in the organization.¹²⁹

The philosophical answer is potentially the more interesting, and also the more problematic, of the two responses. Since experience can be interpreted in highly variant ways by different individuals (whose interpretations may also be at odds with that of the researcher), can validity be ascribed to any of them? Greenfield, influenced by Weber,¹³⁰ thought not, explicitly rejecting Marx's view "that correct scientific inquiry could reveal an objective social structure against which individual's subjective meanings might be seen as 'false consciousness'."¹³¹ Instead, the researcher's theoretical account should only describe and explain the competing interpretations of organizational reality and should not itself become a further interpretation of events, standing at variance with those of the actors.¹³² Others, particularly Gronn¹³³ and Ribbins et. al.,¹³⁴ were quite unwilling to accept that the agent's accounts are sacrosanct

and about which nothing more can be said. Rather, they acknowledged that the researcher must make judgements about the validity of the various interpretations if the self-refuting effects of relativism are to be avoided;¹³⁵ "There is no context in which the researcher can ever escape the necessity of making his *own* interpretation of the meaning and truth of the statements which the actors he is studying make."¹³⁶ How this is to be done remains largely unresolved despite the formulation of a limited set of criteria by which to make such assessments.

Although there is a measure of agreement on the criteria against which both primary (actors) and secondary (researcher) interpretations or theories can be judged, there is also some divergence of opinion on the matter. Apart from the general criterion that any account must be meaningful to those whose conduct is the subject of explanation, there is a further requirement that the interpretation be logically coherent, such that the theoretical constructs and basic assumptions are internally consistent. In addition, while Greenfield¹³⁸ holds that any interpretation must be 'causally adequate', Gibson¹³⁹ and Sungaila¹⁴⁰ argue that any explanation of social events must be consistent with what is known about the physical elements of such phenomena.

Prediction is not denied;¹⁴¹ however, predictions about organizational and administrative behaviour rest not on the assumption that administrators behave in predictable ways according to basic laws but rather that members adopt and follow rules which give rise to routine and ritual, and hence to regularity of conduct.¹⁴² While actors abide by the rules they choose to live by, prediction in terms of personal patterns of behaviour is possible, but since these rules are not immutable, actors may change them, rendering existing predictions invalid.

The implications of research-based theory and knowledge for practising administrators are premised on the principle that facts and values are inextricably interwoven in human action. Since administrative behaviour cannot be derived from facts alone, the onus is on both the researcher and the administrator to not only grasp the empirical elements of the organization but also formulate a set of values which can guide practice.¹⁴³ Because an educational organization is, by definition, concerned with the education of learners, the central values constitutive of administrative behaviour must be those directed at the promotion of the learning-teaching process and the enhancement of educational quality rather than quantifiable and technical efficiency.¹⁴⁴

The knowledge of educational organizations and their administration acquired by the phenomenological researcher is closely linked to the members' 'self-understanding' of their circumstances along with the possibility of changing them. The achievement of such an end as 'human freedom',¹⁴⁵ couched in terms of "enlightenment and liberation from the forces which oppress man",¹⁴⁶ begins with helping the participants to think through in descriptive terms how their organizational world is put together, their part in it, and what alternatives might be possible.¹⁴⁷ According to Greenfield,

what I would like to do is to make people aware of what they are doing, to try and make them think more deeply about what they are doing and the mechanism that I would argue or I would advocate for doing that, is simply description. Description of life in organizations, description of what goes on, opening our eyes in sort of a clear eyed way to life in organizations, what do administrators do...And I hope that if we can get these pictures clear enough, these descriptions powerful enough, it makes us think and reflect.¹⁴⁸

An examination of the various organizational realities should help to reveal the values which lie behind them, leading ultimately to judgements about whether what members and administrators do is right, that is, whether their lives are morally good.¹⁴⁹ Such argumentation is predicated on the premise that the researcher and the administrators of an educational organization will redistribute power away from a coercive, controlling, manipulative approach aimed at suppressing conflict to one which by encompassing a counselling and listening stance enables the facilitation of discourse about the worth of various viewpoints leading to an equitable accommodation of these into the life of the organization.¹⁵⁰ Thus, Vandenberg¹⁵¹ suggests that the views of teachers and pupils must be taken into account when administrators are called upon to make decisions which affect their particular interests.

How the conditions of the organization ought to be changed, and the manner by which they can be changed, are difficult questions for the researcher to answer, but "it is to these questions that researchers should turn if their work is truly to extend our knowledge."¹⁵² Yet, however desirable¹⁵³ or otherwise¹⁵⁴ a commitment to a moral/political ideal may be, the researcher cannot ignore the question of just how free

are the actors to alter not only their definitions of reality but also the material conditions of their reality?¹⁵⁵ The members of the organization addressed by the researcher include those who are, or will be, in positions of organizational power accomplished as a consequence of overt behavioural conformity with the norms of more powerful social groups.¹⁵⁶ Therefore, the success of a researcher's programme of enlightenment and change may well be severely limited by the extent to which the organizational members and administrators are prepared to go beyond the confines of the status quo to reach a fair measure of equality and collaboration.

The phenomenological approach holds a number of attractions not apparent in its positivist rival. The noumenal-phenomenal distinction emphasizes the importance of the theory-ladenness of observation which undercuts the positivist claim that observation is foundational. Inclusion of human subjectivity extends the reach of knowledge beyond that of empiricist inquiry. And the interweaving of the 'is' and the 'ought' adds an important dimension to the study of educational organizations which is excluded by the traditional science of administration. However, notwithstanding these points in its favour, phenomenological inquiry in educational administration contains a number of weaknesses which were quickly exploited by critics. First, by drawing a distinction between the natural and the social worlds and relegating science to the former and giving hermeneutics to the latter, phenomenologists cut themselves off from a source of knowledge which had hitherto contributed to our understanding of the social world. Second, by focussing almost exclusively on the subjective meanings, interpretations and mental states of research participants, phenomenological inquiry failed to recognize that there are objective structural mechanisms in our social organizations which impinge on and shape what we think and do. Third, explanations of human behaviour by reference to mental states, including beliefs and desires, meanings and interpretations, give rise to troubling questions about the status of these entities. Are there such things as beliefs and desires? How can they be foundational if people can be mistaken about what they believe and desire? And, if we inhabit a world of multiple realities consisting of diverse interpretations, none of which can be assessed to be true or false, right or wrong, better or worse, then this relativism renders administrative action at best irrational and at worst impossible.

Although positivist critics have been dismissive of the phenomenological project

in educational administration research, other commentators have been more inclined to recognize its merits while at the same time rejecting it because of its all too obvious limitations. Consequently, there has been an attempt on the part of some theorists to construct an alternative to positivism and phenomenology which combines their virtues but eliminates their vices. Hence the interest of critical theorists in setting out another alternative to the positivist account of inquiry which seeks to avoid the problems of phenomenology.

NOTES

- 1 Willower, 1975b, 77.

- 2 Greenfield, 1975a. Greenfield initially labelled his work 'phenomenological' and it is this label which is used in this chapter to refer to the philosophical position he championed. In his early work, Greenfield made explicit reference to Kant (1929) while his later work acknowledged his indebtedness to Weber (1947) and Kuhn (1970). To some extent the choice of the word 'phenomenology' was unfortunate since Greenfield appears to have obtained it from loose sociological usage rather than from its philosophical home in Husserl's (1970) phenomenology, and this led Willower (1979a) to point out that Greenfield's philosophy had nothing at all to do with phenomenology, at least in its philosophical form. This confusion in terminology was rectified by Greenfield who adopted a new label more appropriate to his position. However, while Greenfield renamed his thought 'subjectivist', others continued to employ the original term, thereby perpetuating the philosophical confusion. But the puzzlement was furthered when various other terms began to appear. In a sense, such labels as 'hermeneutic', 'hermeneutic-phenomenological', 'interpretive', 'subjectivist' and 'qualitative' all pick out and emphasize different aspects of what is a loosely knit set of philosophical ideas. It is clear, for example, that while Greenfield, Gronn, Hodgkinson and Ribbins all share much in common, they do diverge from one another in quite significant ways. Although the term 'phenomenology' is employed in the examination of the general position which they and others adhere to, it should be remembered that the use of the expression merely acknowledges its social-historical origin within an educational administration context and carries with it none of the conceptual baggage usually associated with philosophical phenomenology.

- 3 Sungaila, 1979, 1982.

- 4 Gibson, 1972; Sergiovanni, 1984b.

- 5 Vandenberg, 1982.

- 6 Gray, 1978, 1982; Greenfield, 1978, 1980.

- 7 Owens, 1982; Ribbins, 1986.

- 8 The term 'ideal realism' may initially appear odd, even contradictory. White and White (1976, 8) point out that Greenfield's (1975a, 77) description of 'idealism' states that the world exists but different people construe it in different ways. The Whites argue that while this may be so, the central point is that the world exists and is distinguishable from the interpretations. This is realism, not idealism. Greenfield accepts the existence of an independent physical world (realism) but

denies that we can ever directly and objectively know it (idealism). Hence, the coining of the term 'ideal realism' to refer to the phenomenological metaphysic seems appropriate.

- 9 Kant, 1929.
- 10 Greenfield, 1975a,80.
- 11 Sungaila, 1982, 64.
- 12 Bruce, 1977, 116.
- 13 Greenfield, 1980, 41.
- 14 Greenfield, 1982, 5.
- 15 Greenfield, 1983a, 2.
- 16 Greenfield, 1975a, 78.
- 17 Sergiovanni, 1984a, 2.
- 18 Greenfield, 1975a, 76.
- 19 Greenfield, 1983a, 55.
- 20 Gibson, 1972, 126.
- 21 Greenfield, 1980, 30.
- 22 Gray, 1980, 40; Greenfield, 1979a, 109.
- 23 Gray, 1980, 29.
- 24 Greenfield, 1982, 5.
- 25 Gibson, 1972, 121-2.
- 26 Greenfield, 1980, 29.
- 27 Greenfield, 1978, 8.
- 28 Greenfield, 1979a, 110.
- 29 Greenfield, 1984, 142; Although Greenfield has consistently maintained that there are no objective criteria available for determining the correctness of our theories about reality, there is evidence that on occasions he does accept that such criteria are possible. For example, in defending his position, Greenfield (1979a, 110) writes:

We have been caught in a trap that requires us, in the name of theory to hold a single image up to reality and test whether it is true - or at least whether it is a 'better' and more accurate representation of reality than other image.

Yet, in his examination of the connection between image and reality, Greenfield (1979b, 173), drawing off the analyses of everyday experience proffered by the ancient philosophers of Greece, offers an example which runs counter to his thesis.

Some travellers approach a tower which they see first from a

distance. From this perspective, the tower appears round. At close quarters, however, they see that the tower is 'really' square. With this truth in mind, the travellers continue on their journey. On looking back at the tower from a distance once more, they find that it again looks round, though they now 'know' that it is square.

Despite placing quote marks around 'really' and 'know', it is clear that Greenfield accepts that objective evidence can serve as a criterion, for he acknowledges that one belief (squareness) is better or more correct than the other (roundness), with such a judgement being grounded in the objective reality of the tower's squareness.

- 30 Greenfield, 1977, 96-8.
- 31 Hodgkinson, 1983, 34.
- 32 Hodgkinson, 1978a, 106.
- 33 Greenfield, 1981, 9; Hodgkinson, 1983, 12.
- 34 Hodgkinson, 1978a, 106.
- 35 Greenfield, 1980, 31. Hodgkinson (1978a, 62) argues that it is logically impossible for educational administrators to simply consider the 'facts of the case' and then act accordingly. To attempt to do so commits Moore's (1903) naturalistic fallacy which asserts that no amount of facts can lead to a value. Rather, inclusion of a value premise is required before a conclusion can be drawn about what administrative action ought to be engaged in. (Note that Hodgkinson is mistaken in attributing this to Moore - it should be attributed to Hume).
- 36 Gray, 1982, 35.
- 37 Greenfield, 1986, 51.
- 38 Gray, 1982, 30.
- 39 Greenfield, 1983a, 38.
- 40 Greenfield, 1975a, 78.
- 41 Gibson, 1972, 120.
- 42 Gray, 1982, 37; Greenfield, 1975a, 74; Sergiovanni, 1984b, 281.
- 43 Hodgkinson, 1978, 142.
- 44 Gray, 1982, 31; Greenfield, 1980, 27.
- 45 Greenfield, 1984, 150.
- 46 Greenfield, 1983a, 6; Hodgkinson, 1978, 28.
- 47 Gray, 1982, 32; Greenfield, 1973, 556.
- 48 Hodgkinson, 1978a, 39; Riffel, 1986, 163.
- 49 Greenfield, 1983a, 35.

- 50 Gray, 1980, 11; Greenfield, 1975a, 79.
- 51 Gray, 1982, 30; Greenfield, 1973, 556; Ribbins, et. al., 1981, 170; Riffel, 1986, 163.
- 52 Gray, 1982, 38.
- 53 Gibson, 1977, 38.
- 54 Gray, 1980, 11. Gray (1980, 33) does admit that in practice no formal, legally constituted organization can be established without some sort of 'structure' being put forward, but he argues that such an 'on paper' structure is notional; structure becomes real when people begin to interact.
- 55 Greenfield, 1975a, 72.
- 56 Gray, 1980, 12.
- 57 Greenfield, 1973, 557.
- 58 Greenfield, 1986, 72.
- 59 Greenfield, 1973, 553.
- 60 Gray, 1978, 124; Greenfield, 1975a, 86; Hodgkinson, 1978, 37.
- 61 Gray, 1980, 12.
- 62 Greenfield 1973, 557.
- 63 Gibson, 1972, 121.
- 64 Gibson & King, 1977, 18.
- 65 Gibson, 1972, 122; Gray, 1980, 27; Greenfield, 1984, 151; Hodgkinson, 1983, 31; Sergiovanni, 1984b, 278.
- 66 Gibson, 1972, 122.
- 67 Sergiovanni, 1984b, 278.
- 68 Levine, et. al., 1984, 101.
- 69 Greenfield, 1980, 26.
- 70 Hodgkinson, 1978, 122. According to Willower (1994, 13-4), Hodgkinson's writings on values is important to Greenfield who has not gone beyond this to develop a theory of ethical choice or a conception of values. He does, however, cite Hodgkinson approvingly in this connection. Hodgkinson's treatment of values is quite well developed and is specifically applied to administration. In addition, it appears to be generally consistent with the kind of subjectivism Greenfield has adopted.
- 71 Greenfield, 1984, 146.

- 72 Greenfield, 1983a, 48.
- 73 Greenfield, 1985a, 5248; Holmes, 1986, 84.
- 74 Hodgkinson, 1983, 29.
- 75 Gibson, 1972, 120.
- 76 Hodgkinson, 1978, 5.
- 77 Hodgkinson, 1978, 8.
- 78 Greenfield, 1985a, 5248; 1986, 74; Hodgkinson, 1978, 80.
- 79 Greenfield, 1975a, 87.
- 80 Greenfield, 1983a, 41; Hodgkinson, 1978, 81.
- 81 Greenfield, 1982, 8; Gronn, 1983b, 1-21; Hodgkinson, 1978, 82-3.
- 82 Gibson & King, 1977,24; Greenfield, 1975a, 81-2; 1980, 50-1; Hodgkinson, 1986b, 18-20; Riffel, 1979, 201; Sungaila, 1979, 88; Taylor, 1984, 125-6; Tipton, 1977, 49.
- 83 Gibson, 1972, 124; Gray, 1982, 34; Greenfield, 1980, 51; Hodgkinson, 1986b, 18; Sergiovanni, 1984b, 276; Sungaila, 1979,89.
- 84 Greenfield, 1975a, 94-5; 1979a, 103; Hodgkinson, 1986b, 18-20; Sergiovanni, 1984b, 278-9; Vandenberg, 1982, 26.
- 85 Greenfield, 1975a, 82.
- 86 Gibson & King, 1977, 24; Sergiovanni, 1984b, 278; Sungaila, 1982, 64.
- 87 Bruce, 1977, 114; Gibson & King, 1977, 24; Gray, 1980, 11; Greenfield, 1975a, 90; Iannacone, 1973, 65; Ribbins, et. al., 1981, 163; Sergiovanni, 1984b, 278; Sungaila, 1982, 64.
- 88 Gray, 1980, 42; Sergiovanni, 1984b, 278.
- 89 Bruce, 1977, 114; Greenfield, 1975a, 83; Iannacone, 1973, 64; Sergiovanni, 1984b, 278.
- 90 Greenfield, 1973, 558; Ribbins, et. al., 1981, 163.
- 91 Greenfield, 1973, 564; Sungaila, 1982, 64.
- 92 Greenfield, 1980, 26.
- 93 Greenfield, 1982, 5; Hodgkinson, 1986b, 20.
- 94 Ryle, 1971, 474.
- 95 Gronn, 1982,26. For a minor dispute on whether Ryle's argument is a 'hoax' and

- a case of 'semantic acrobats', see Thomas (1986) and Gronn (1987).
- 96 Owens, 1982, 7.
- 97 Greenfield, 1987a, 103.
- 98 Greenfield, 1973, 563; Iannacone, 1973, 66.
- 99 Greenfield, 1975a, 83.
- 100 Greenfield, 1973, 559; Owens, 1982, 7.
- 101 Greenfield, 1982, 8; Gronn, 1983b; Levine, et. al., 1984.
- 102 Levine et. al., 1984, 101.
- 103 Searle, 1969.
- 104 Gronn, 1982, 23.
- 105 Ribbins, et. al., 1981, 162-3.
- 106 Greenfield, 1982, 6.
- 107 Gronn, 1983, 23-4; Ribbins, et. al., 1981, 162-3.
- 108 Greenfield, 1982, 5.
- 109 Greenfield, 1979a, 103.
- 110 Greenfield, 1980, 40.
- 111 Greenfield, 1980, 49.
- 112 Gibson, 1972, 123.
- 113 Hodgkinson, 1986b, 20; Iannacone, 1973, 63; Owens, 1982, 7.
- 114 Gray, 1980, 29-30; Hodgkinson, 1986b, 20.
- 115 Gray, 1980, 35; Hodgkinson, 1986b, 19.
- 116 Weber, 1947. See Greenfield (1973, 558) and Hodgkinson (1986b, 19).
- 117 Greenfield, 1975a, 82.
- 118 Gray, 1980, 27; Greenfield, 1975a, 81; Tipton, 1977, 49.
- 119 Bruce 1977, 114; Greenfield, 1980, 32.
- 120 Greenfield, 1984, 156; Hodgkinson, 1986b, 20.
- 121 Greenfield, 1986, 75.
- 122 Gibson & King, 1977, 22; Gray, 1982, 33; Greenfield, 1979b, 179; Hodgkinson, 1986b, 29; Sungaila, 1979, 89.
- 123 Gray, 1982, 33.
- 124 Ribbins, et. al., 1981, 171; Willower, 1985b, 17.
- 125 Gibson, 1972, 124.

- 126 Greenfield, 1973, 568.
- 127 Greenfield, 1975a, 90.
- 128 Gibson, 1972, 124.
- 129 Greenfield, 1975a, 90.
- 130 Weber, 1947.
- 131 Greenfield, 1977, 94.
- 132 Greenfield, 1979, 103.
- 133 Gronn, 1983, 22.
- 134 Ribbins, et. al., 1981, 165.
- 135 The problem of relativism for phenomenologically-inspired inquiry has been raised by Gronn (1983, 15) and White and White (1976, 8), particularly in relation to Greenfield's (1975a) early work. Even though the self-referential refutation of a relativist epistemology is now recognized, this has not stopped Riffel (1986,155) from arguing that a sense of relativism is necessary for the development of theory in educational administration. While he rejects simple or naive relativism, it is not clear what sort of relativism he is advocating.
- 136 Ribbins, et. al., 1981, 163-4.
- 137 Gibson, 1972, 124; Gray, 1980, 35; Greenfield, 1975a, 82.
- 138 Greenfield, 1979a, 103.
- 139 Gibson, 1972, 124.
- 140 Sungaila, 1979, 89.
- 141 Gibson, 1972, 121; Gray, 1980, 35.
- 142 Greenfield, 1975a, 75.
- 143 Greenfield, 1980, 43; 1981, 10.
- 144 Gray, 1980, 21; Holmes, 1986, 87; Levine, 1975, 21; Ogilvie, 1982, 39; Vandenberg, 1982, 25.
- 145 Greenfield, 1975b, 2.
- 146 Greenfield, 1975a, 82.
- 147 Greenfield, 1977, 89.
- 148 Macpherson, 1984, 4.
- 149 Macpherson, 1984, 4.
- 150 Bruce, 1977, 114; Grey, 1980, 47-9.
- 151 Vandenberg, 1982, 25.

- 152 Greenfield, 1979b, 179.
- 153 Holmes, 1986, 90.
- 154 Tipton, 1977, 49.
- 155 Gronn, 1986, 50.
- 156 Tipton, 1977, 51. Such social groups may include both formal organizations such as the Ministry of Education and the Education Review Office, and informal pressure groups.

CHAPTER FOUR

PHILOSOPHICAL TRADITIONS OF RESEARCH INTO EDUCATIONAL ADMINISTRATION (3) : CRITICAL THEORY

The idea that inquiry in educational administration has historically alternated between quantitative (or positivist) and qualitative (or phenomenological) approaches is a compelling one, as Culbertson¹ has recently demonstrated. Yet, despite the competing and sometimes extreme claims made by proponents from each camp, a number of commentators have observed that neither approach provides an adequate epistemic foundation for research into social phenomena. Rather, "what seems to be needed is a *rapprochement* of these two points of view."²

RAPPROCHEMENT³

One of the earliest calls for the unification of quantitative and qualitative research in educational administration came in 1936 when Cummings⁴ argued that the character of social reality consists of more than quantitatively measurable factors; meanings and interpretations must also be taken into account. Since 'quantity' and 'quality' are assumed to be equally important aspects of a single reality, no dualism exists between them, for both are conjoined in all social phenomena. Accordingly, while some elements are more amenable to quantitative analysis, others are not, so the limitations of each approach must be acknowledged. Scientific research in educational administration requires a more functional definition of 'science' which not only recognizes the unitary nature of reality but also admits the unity of the 'objective' and 'subjective' which underpin the combined use of many techniques and methods, especially if hitherto unexamined qualitative processes ignored by a narrow form of science are to be opened up for scientific investigation. However, there is no documentary evidence to suggest that Cumming's thesis gained any currency.

The same themes were to re-emerge, initially in the late 1950's and early 1960's in reaction to the theory movement, and later from the mid-1970s onwards following the

emergence of the phenomenological alternative.

A fundamental question in the debate, according to Culbertson⁵ is whether or not natural and social phenomena are ontologically of the same kind. Three answers are possible: they are identical, they are different in degree, or they are different in kind. Culbertson suggested that few would argue that they are the same. So, the issue is whether they are different in degree or kind. Culbertson concludes that the differences are in kind on the grounds that (1) human beings can through intervention change the course of their own affairs but not that of nature, (2) social life involves moral considerations about what 'ought' to be done, and (3) mental perceptions, thought processes and language inhere in humans but not nature.

Our beliefs about natural and social phenomena presuppose the unity of 'is' and 'ought' which are "the warp and woof of the same piece of cloth."⁶ Since truth, value and theory are all products of the human mind, they all stand in need of being tested. To separate them into the testable and the non-testable is to regress into a non-productive dichotomy.⁷ As Hare⁸ has noted, not only are certain values presupposed in the pursuit of truth while rational discussion of ends is possible, but more significantly, "it is not even clear that the notions of truth and falsity do not apply to evaluative judgements in much the same way as they apply to factual ones."⁹ In addition, Taylor¹⁰ points out that there is good reason to suppose that some criteria of truth and validity of knowledge and appreciative frameworks are universal and fundamental while those criteria of a context-dependent and variable nature are parasitic on the former.

A more comprehensive account of organizations was also called for. If some systems approaches, especially structural functionalism, emphasized the ontological priority of abstract properties of organization over the actions of those who inhabit them, then the phenomenological alternative, by claiming that organizations are no more than how members define them, ignored certain structural elements. What is required, suggests Hoyle,¹¹ is a recognition that while each educational organization is unique in terms of the 'real life' of people, it also exhibits some regularities of behaviour within, as well as having common characteristics with other such organizations. Although the social structure of an organization can be distinguished from its culture,¹² actions are governed not only by intentions but also by "a variety of antecedents beyond those which can be conceived of by their authors,"¹³ and give rise to unintended

consequences which were not anticipated.¹⁴ Furthermore, administrative behaviour is predicated on both formal and tacit knowledge, the former embodied in explicit theories, while of the latter the administrator is not even fully aware.¹⁵

However, the major focus of attention was primarily directed at a methodological unification of scientific and interpretive approaches to research.¹⁶ Phenomenological inquiry can provide valid knowledge of the experienced reality of members of an educational organization, albeit limited to the settings in which it is formed.¹⁷ This entails a degree of empathic understanding such that administrator behaviour is apprehended in terms of self understanding.¹⁸ Yet, the limitations of hermeneutic analysis must be acknowledged; while hermeneutic inquiry can play an important role in developing theoretical understanding in educational administration, it fails to deal with the structural aspects of organizational life.¹⁹

The place of science in research was also affirmed, for it was recognized that science has the potential to extend beyond the direct experience of the individual to deal with aspects of administration not readily apparent to commonplace understanding.²⁰ The regularities of organizational and administrative processes warrant the formulation of generalizations which may stand in marked contrast to individual perception.²¹ Therefore, it is through science that organizational structures may be isolated and analyzed in a systematic manner.²² But scientific inquiry on its own has nevertheless been deemed to fall short of adequately explaining administrative phenomena.²³ Rather, "when properly understood, the natural science and hermeneutic approaches complement and, indeed, presuppose each other."²⁴ One outcome of this has been the meshing of experiential knowledge of the administrator with the theoretical explanations of the researcher to generate grounded craft theory.²⁵

The union of knowledge and action is to be found in 'theories of practice'²⁶ which not only integrate scientific and interpretive knowledge but also encompass moral considerations of purpose, policy and ethics which daily confront administrators. Given that theories of practice are concerned with improving administrative practice, they "need to be linked first and foremost to the *raison d'être* of educational organizations and their mission of effective learning."²⁷

CRITICAL THEORY

Efforts to construct a coherent philosophy of inquiry which could in some way embody both scientific and interpretive traditions, and yet go beyond them, began to converge in the late 1970's and early 1980's. The appropriation of critical theory was initially seen in Gibson's²⁸ synthesis of objective explanation and subjective understanding in administrative praxis and Riffel's²⁹ discussion of the way Habermas brought the empirical, hermeneutic and critical sciences together as constitutive elements of a human interest in emancipation. However, Habermasian critical theory has most clearly manifested itself in the work of Bates, Foster and Watkins with an emphasis on the sociological-political analysis at the expense of a lucid articulation and defence of the philosophical line of argument.

Although Bates³⁰ has distanced himself from the objectivist, realist view of the world as construed by logical positivism in favour of the proposition that to some extent we construct the reality of physical objects and social experience, it is nonetheless evident that such an account does not accept the idealism of phenomenological theory. Rather, there is a recognition that there are forces and structures which impinge on people's behaviour, for as Bates, quoting Marx, notes, "men make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered and transmitted from the past."³¹ Our knowledge of the world, far from resting on a separation of fact and value, presupposes their interpenetration, since it is impossible to eliminate evaluative judgements from the interpretive frameworks within which facts are sought and understood:³²

When we examine those empirical theories that have been advanced, we discover again and again that they are not value-neutral, but reflect deep ideological bases and secret controversial value positions. It is a fiction to think that we can neatly distinguish the descriptive from the evaluative comments of these theories, for tacit evaluations are built into their very frameworks.³³

Habermas's project has been to show that while a distinction can be drawn between empirically derived facts and socially derived norms, the positivistic separation of facts and values is quite inappropriate, for to do so not only denies the possibility of rational

discourse about values but also denies that theories about reality rest on standards which require critical justification.³⁴ Descriptions of the world are "not independent of standards which are used, and standards rest upon attitudes which are in need of justification through supporting arguments."³⁵ As a consequence, Habermas has sought to construct a theory of empirically verifiable norms present in an 'ideal speech situation' and presupposed in actual speech, thereby giving rise to a consensus theory of truth in which different speakers of a language possess varying degrees of communicative competence and are able to agree on the factual basis of discussion.³⁶

Educational organizations are 'social constructions of reality'³⁷ constituted by a dialectic relationship of structure and agency which generates an on-going transformation process as a result of the mediating capacity of human consciousness.³⁸ Educational organizations are characterized by certain regularities - bells ring at scheduled times, teachers do appear when and where they are supposed to, and so on. However, the regularity embedded in structural relations is generated by a rule-governed system which is culturally determined³⁹ such that the regularities of social action which lie beneath the surface of organizational relationships⁴⁰ are human regularities tied to the culture of the organization, and in being hermeneutically derived are capable of being changed in significant ways.⁴¹ Agency, bound by the moral universe of meaningful relations, emphasizes the interpretation of subjective meaning and the construction of shared social realities⁴² which, contained in social rules, give rise to regularities of behaviour, and with changes to the rules come changes in behavioural regularity. Thus, structure and agency each presuppose the other and are mutually determining.

Organizations are the embodiment of culture, and it is culture which gives meaning to life. The culture of an organization - the beliefs, languages, rituals, knowledge, conventions, and so on - provides the resources from which members of the organization construct their understandings of the world and of themselves. Culture, mediated by the structure-agency nexus, is partly factual, being empirical, descriptive and objective, and partly interpretive, concerned with meaning and the rules inherent in understanding and action.⁴³ Within educational organizations, the contestation of what is to constitute the culture of the organization is grounded in the moral universes created by the members of the organization, and is characterized by

struggles over unequal power relations and the inequitable distribution of resources.⁴⁴

The impact of Habermasian thought is powerfully expressed in the idea that educational organizations are speech communities. Speech acts presuppose an 'ideal speech situation' bounded by four 'universal pragmatics' required for intersubjective understanding: comprehensibility (that we have encased our sounds in a shared grammar), truth (that there is a factual basis for the discussion), truthfulness (that the speaker's intentions are sincere, not deceptive) and rightness (that the utterance is appropriate in the context in which it is uttered).⁴⁵ Distortions of communication occur when speakers violate these standards of practice.

The administration of educational organizations is located in speech communities which are rooted in social structures and the development of moral universes;⁴⁶ it is a mediating process in the exercise of power, being thought of as "a set of practices concerned with the control, direction, and development of the institution,"⁴⁷ and taking its direction from the activity being administered, that is, education.⁴⁸

For critical theorists, research into educational administration is grounded in the unity of the empirical, hermeneutic and critical sciences, with all three being apprehended in both the form and the object of inquiry. The form of inquiry is governed by the fact that science is deeply embedded in the attitudes and values of the scientific community, and agreement over the conduct of science which grows out of these norms is open to critical debate.⁴⁹ Scientific theories are constructed by scientists and are subject to changes of meaning which originate in part from the social and political context of scientific activity.⁵⁰ Foster,⁵¹ influenced by Apel's⁵² analysis, argues that the empirical and hermeneutic sciences are non-reductive: the objective language of science must be 'understood' which implies a pre-understanding of the concepts of a community of scientists. The objective explanation of facts and the intersubjective communication about what is to be explained are complementary: "They exclude each other and they presuppose each other. Nobody can just 'understand' without presupposing factual knowledge which could be stated explicitly as 'explanations'. On the other hand, no natural scientist can explain anything without participating in the intersubjective communication."⁵³ Science, as a critical pursuit, is itself subject to critique.

The object of inquiry also gives rise to a tripartite configuration of research: the

explanation of organizational structure, the interpretation of meaning, and the critique of social arrangements.⁵⁴ Habermas⁵⁵ posits three fundamental aspects of the human condition which are to be found in organizational arrangements. Labour (or work) is the production of things; communication is the shared development of meaning; power expresses political relationships. Arising out of these are three anthropologically given 'cognitive interests': a technical interest oriented to establishing control over nature and gaining objective knowledge; an historical-hermeneutic interest aimed at the understanding and interpretation of human action and history; and an emancipatory interest directed at realizing the conditions of freedom.⁵⁶ Foster argues that

an administrative science can be empirical but also must incorporate hermeneutic and critical dimensions. One face is turned towards the discovery of empirical data about organizations and how they are socially constructed. Nonpositivistic studies which explore organizational and administrative realities are called for. A second face is designed to probe the meanings, understandings, and intentions of actors in the constructed social settings. Historically relevant, interpretive approaches are called for. A third face has to do with the grounding of administration and organizational study in a value-based tradition which allows us to explore taken-for-granted structures with a concern for how they may contribute to the oppression of the human spirit.⁵⁷

Research must focus on the cultural elements of educational organizations to reveal the meanings of actions in terms of both the actors' intentions and the social rules which govern such actions.⁵⁸ However, researchers should not accept at face value the accounts of the organization given by its members; rather, there must be a penetration behind the administrators' subjective beliefs of the administrative processes to explore the structure of the organization which induces them to behave in particular ways.⁵⁹ Hence, there is a place for empirical science which can not only generate predictive knowledge of social relations⁶⁰ but because it is grounded in an analysis of empirical regularities can also provide quasi-causal accounts of the connection between organizational structure and administrative behaviour.⁶¹ Accordingly, inquiry should accept and build upon both the hermeneutic and empirical traditions, using the analyses of structural regularities and phenomenological interactions as the basis of

critique. Reflexive thought, as a key feature of the critical theorist's programme, seeks to reveal relationships of domination, submissiveness and dependency and unwarranted constraints on freedom and action which had previously been concealed from members of the organization so that they come to comprehend the true conditions of their existence.⁶² Critique endeavours to uncover the sources of frustration and ideological repression and identify possible courses of action which might bring about alterations to existing conditions.⁶³ Critical research seeks to

determine when theoretical statements grasp invariant regularities of social action as such and when they express ideologically frozen relations of dependence that can in principle be transformed. To the extent that this is the case, the critique of ideology...(takes) into account that information about law-like connections and sets off a process of reflection in the consciousness of those whom laws are about. Thus, the level of unreflected consciousness, which is one of the initial conditions of such laws can be transformed.⁶⁴

Hence, the hermeneutic methods of the cultural sciences, the objective methods of the natural sciences and the reflective methods of the critical sciences come together to expose how organizational and administrative power is developed, exercised, perpetuated, experienced and accepted.⁶⁵ The ideology-critique of how members of an educational organization come to accept repressive social conditions and develop false consciousness is rooted in Habermas's theory of communication. A comparison of the actual language in the administrative context with the criteria of the ideal speech situation may well reveal hidden patterns of distorted communication and disclose how certain forms of domination are imposed through the language of administration.⁶⁶ The force of the critical theorists' approach to research is clearly expressed in Foster's contention that

the conception that educational institutions can be thought of as *speech communities* allows the incorporation of hermeneutic, structural, and critical elements. The phenomenological approach can be incorporated insofar as it allows one to investigate how meaning about the organization is intersubjectively communicated and created; the structural approach is necessary because it allows investigation of the 'grammar' of the

institution, or the structural features that hold the meaningful system together; the critical dimension is necessary because it asks in what ways does the institutional structure contribute to the distortion of communication between individuals.⁶⁷

The notion of an 'ideal speech community' provides the link between knowledge and action. A central thrust of the researcher must be 'raising the consciousness' of administrators and members of educational organizations so that the distortions in communication which often reflect the interests of the administrators can be corrected to reflect the interests of all members. This entails the adoption of democratic interaction guided by Habermas's 'universal pragmatics'.⁶⁸ An expanded rationality encompassing open debate and criticism of means and ends, inequalities of power and status, and conflicting beliefs and values, rests on a set of norms, including social justice, equality, autonomy and self-determination, and freedom and emancipation.⁶⁹ The empowering of all members to contribute to organizational 'betterment'⁷⁰ necessitates decision making over "what is the *best* thing that *can* be done?"⁷¹ when problems need resolution. This carries with it consideration of empirical, ethical and practical issues: science, by unmasking causal connections, can provide knowledge which makes possible the control of either bringing about or preventing particular states of affairs;⁷² the creation of a moral universe brings with it recognition that the efficiency demanded of educational administrators is not simply a technical matter but is one infused with and transcended by ethical concerns directed at the ends of schooling;⁷³ while praxis, or practical action informed by theory, leads to more acceptable social structures.⁷⁴

A fundamental principle of the critical theorists' position is that researchers should have normative interests in the accomplishment of human emancipation, being placed in the role of social critic whose responsibility it is to evaluate, explore, educate and transform, and offer organizational members the opportunity to free themselves from the ideological forces which mask their understanding and prevent change.⁷⁵ Since the character of administration is shaped by the activity being administered, it follows that an educational model should inform administrative practice.⁷⁶ Both Bates⁷⁷ and Foster⁷⁸ press for the adoption of Fay's 'educative' model of social action: according to Fay, the purpose of social science and social scientists (including those researching

educational administration) is

to enlighten the social actors, so that, coming to see themselves and their social situation in a new way, they themselves can decide to alter the conditions which they find repressive. In other words, the social scientist tries to 'raise the consciousness' of the actors whose situation he is studying.⁷⁹

Implicit in such an approach is the assumption that educational administration should empower the powerless, with power being provided not only by education but also through access to and participation in democratic decision making and non-coercive administration.⁸⁰

While the Habermasian project is the dominant, and perhaps the most widely known, version of critical theory in educational administration, it is by no means the only one. There are other versions of critical theory which have more recently been promoted as alternatives to the Habermasian model. Of these, two need concern us: One, developed by Smyth⁸¹, although derived in part from the Habermasian account, deviates from it in significant ways; the other, proposed by Maddock⁸² repudiates Habermasian theory in favour of the work of an early critical theorist, Adorno. As these lesser known strands of critical theory take hold, it is possible that their influence will be such as to widen the debate within critical theory itself, thus contributing to a more complex and comprehensive philosophical tradition.

Smyth's version of critical theory represents a modification of the Bates/Foster account. Although the research implications have not been presented in any detail, enough has been said to identify some of the key pointers. First of all, critical research, according to Smyth⁸³ must acknowledge Bernstein's⁸⁴ claim that inquiry has three fundamental requirements: (1) there must be an empirical component linked to evidence; (2) it must possess an interpretive element to convey intersubjective human meaning; and (3) it must be normative to provide directions for transformative action. Accordingly, critical research in educational administration can be seen to possess all of the following characteristics: openly ideological insofar as values are acknowledged and acted upon; socially critical, so as to unmask dominant viewpoints; overtly political, with the avowed aim of achieving change; and emancipatory in origin to free those who are oppressed or marginalized. Smyth provides a list of what critical research purports

to do: while the particular items give focus to such inquiry, some of them are contradictory, so their usefulness is less than expected. Critical research

(1) starts out from a position of challenging conventional and taken-for-granted interpretations, and seeks to locate meaning in the larger social-cultural-economic-political context.

(2) is reflexive of its own biases, limitations and distortions - while, like other forms of inquiry, it develops categories, themes and patterns out of data, these are held to be problematic.

(3) is not about 'discovering truth' or 'telling it like it is' but rather has an interest in 'interrupting social practices' and seeking to make them otherwise, yet it is also concerned with the forces that have worked to make things the way they are, how such forces are sustained and maintained. These two foci seem incompatible.

(4) is 'advocacy-oriented', as noted above, insofar as it seeks to go beyond description of the way the world is, to prescribe how the world ought to be.

Because of the recent, and continuing, changes which have been wrought on educational organizations and how they are administered, there is a need to devise new ways to investigate, describe, analyze and reconstruct what is happening. Smyth⁸⁵ suggests that we need to reconfigure educational administration research in order to "come to know reality 'through prolonged participation in it.'" Rather than continuing to research in detached, objective, value-neutral ways, researchers need to generate more robust forms of data generation which not only permit descriptions of what goes on but also to 'interrupt' administrative behaviour to change things through a 'transformative intent' geared to the interests of those who suffer most from the unequal distribution of power. The particular methodological wedge for achieving this is critical ethnography which attempts to deal with both structural features of the situation and the meaningfulness of the participant's everyday action. In short, critical ethnography means regarding 'all modes of knowing and all particular knowledge forms as ideological'⁸⁶, a somewhat problematic requirement since, paradoxically, this requires that critical ethnography and the knowledge it produces are no less ideological than those other forms of inquiry and knowledge which it rejects as ideological.

Although committed to critical theory, Maddock⁸⁷ is of the view that the Habermasian version is seriously flawed. He largely accepts that the sorts of criticism

mounted by Lakomski⁸⁸ have considerable force, thus presenting real problems for a critical theory of educational administration research which draws off this model. For example, the Habermasian separation of instrumental action and social interaction has serious implications for women - the division of social contexts may conceal the conditions for their exploitation. More importantly, philosophically, Habermas is uncritical of the image of science incorporated into his analysis. Even the later, and substantially modified, version of Habermasian critical theory is, claims Maddock⁸⁹, problematic, and in its revised form fails to provide the sort of theoretical account which Bates and Foster require.

In his more recent work, Habermas⁹⁰ offers a somewhat different account of philosophy in relation to science. Philosophy is viewed as a stand-in (Platzhalter) for science - that philosophy should, and on some occasions does, play a significant role where science has yet to get a grip. Philosophical theory stands as a proxy for scientific theory, building potential empirical theories out of the more general claims of empirical theories in other domains. Maddock⁹¹ finds this all rather problematic, pointing out that the sort of philosophical stand-in theory proposed could only provide the most limited of empirical theory. One central objection is this: if the philosophical stand-in theory is, at some later time, to be replaced once science becomes a going concern, then there is a problem concerning the truth of its theoretical claims, for such philosophical theory then merely serves a heuristic purpose, being expendable when confronted by an adequate scientific theory. Here, philosophy is to be seen as providing first theory to be discarded at the earliest opportunity by empirical science. Maddock finds this disciplinary relationship an unattractive one for philosophy.

Maddock⁹² also notes the naturalistic emphasis in later work, especially in the way ethics is explained scientifically. The theoretical analysis provided by a Habermasian critique is no longer driven by the pursuit of emancipation in any a priori sense, but is grounded in an anthropological claim that onto-genetically communicative action is prior to instrumental action. In other words, communicative action already implies the conditions of emancipation such as honesty, reciprocity, autonomy and equality, conditions all required for free and frank discussion. For Habermas, communication has primacy over instrumental action. Maddock⁹³ suggests that while the Habermasian account of educational administration research seeks to overcome

the limitations of both positivist and phenomenological inquiry by dwelling on the conditions required for free, open discussion about practical matters, beyond this it has little to offer such research other than the ongoing comparison of actual with ideal speech. Thus, the linguistic turn in Habermas's writings leads Maddock to question whether it is able to make the sort of contribution to educational administration that its proponents claim.

Other critical theorists in educational administration, recognizing some of the Habermasian limitations, have departed from this framework to some extent. Giroux⁹⁴, for example, develops more of an eclectic critical theory which attempts to marry some of the core ideas from Habermas with those of one of his predecessors - Horkheimer. Thus revised, Giroux's version of critical theory sets out an epistemological base which permits the development of modes of critique to illuminate the interaction of the social/personal and the historical/private elements of experience. However, according to Maddock, those like Giroux who attempt to arrive at an eclectic picture of critical theory derived from Habermas and the earlier theorists fail to disengage themselves from the Habermasian idea that emancipation can be achieved through the perfection of reason. Accepting that the Habermasian account, taken on its own or in conjunction with other versions, remains flawed with little relevance to educational administration, Maddock holds that an adequate critical theory must be reconceptualized in accordance with that version constructed by Adorno.

Adorno's account of critical theory is, for Maddock, an improvement on the Habermasian version, since the former is able to avoid many of the criticisms which have been levelled against the latter. Adorno's conception of philosophy deviates markedly from that of Habermas in its relation to science. Drawing from the Messianic ideas within Judaic culture, especially that of redemption after the fall, Adorno characterizes both philosophy and critical theory as an endeavour guided by the notion of utopia as no more than a dim recollection, being the ideal content of the past and an image of the future. Given a materialist twist, Adorno's account is of a utopian future where humans relate directly and sensuously again, but that such a vision cannot be attained while there remains an attachment to mediation and control. At the heart of Adorno's philosophy is a theory of consciousness - the search for subjective identity which gives priority to instrumentality over intersubjective communication. It is here, at

the most basic level, that the divergence between Adorno and Habermas is, according to Maddock⁹⁵, most apparent. Whereas Habermas stresses the primacy of intersubjectivity and communication over subjectivity and instrumentality, Adorno adheres to the opposite with the consequence that he places great emphasis on concrete conditions rather than abstract reasoning.

Adorno's⁹⁶ views on culture and administration provide an alternative direction for critical theory in educational administration research. The emphasis on the sensuous, and the redemption of a fallen ideal of subjective identity, places the focus on a concrete approach where each situation is regarded as unique and peculiar. Analysis of a concrete situation demands attention be paid to the complexity of the factors involved - this entails a distinctly historical dimension without undue attention being given to either abstract reasoning or empirical claims⁹⁷. For Adorno, the search for subjective identity is hindered rather than helped by the move to science. The replacement of the philosophical by science gets in the way of redemption, for science attempts to subsume individuals under universal laws, thereby denying the uniqueness and particularity of concrete situations. The search for generalizations by which to capture particulars destroys the subjective identity of the self. Rather than enhancing redemption, science gets in the way and frustrates the process by what Adorno calls 'reason of judgement' - although the quasi-deductive thought of such judgement is designed to overcome our confusion and propensity for error by offering systematic precision and rigour it simply fails to address sensuous experience. Because scientific statements remain mediated by confused reason, they are not able to 'harmoniously describe concrete objects', and so can never be true. True statements are unmediated and sensuous.

Maddock⁹⁸ contends that, while Adorno does not use the term, the latter nonetheless conceives of administrative understanding as a form of phronesis - a type of practical knowledge embedded in concrete conditions. Phronesis is a mix of instrumental control and taking account of all that it is prudent to consider. It encompasses both theoretical and empirical understanding, and includes political and ethical elements as well as social traditions. While employing the technical advantages of science, more is required - the relevant facets of individual agency and social context must be taken into account although a slide into arbitrary subjectivity must be avoided.

Administrative decisions are decisions of principle which both create and reflect a normative style. That is, administrative conduct should, as far as possible, be constituted by subjective identity or sensuousness. The implications for educational administration are reasonably clear: a critical theory of educational administration research must abandon the search for universal laws or general explanations in order to generate adequate responses to unique and particular circumstances. What is eschewed is both subjectivism and universalism - the scope and the limits of both subjective understanding and abstract reasoning must be recognized. On their own neither is sufficient - both must combine in a harmonious fashion to permit educational administrators to deal with the concrete circumstances which confront them. If this is so, then such a version of critical theory, according to Maddock, does not provide the sort of positive directions for administrative practice which, he claims, is beyond the scope of any account of critical theory, Habermas's included. In the concrete circumstances which educational administrators find themselves in, "the best that can be offered is prudential advice: to consider the myriad of factors which merit consideration, to consider if and when it is appropriate to adopt an intersubjective consensus, when scientific pronouncements are relevant, if and when instrumental efficiency is to be valued and when tradition is important"⁹⁹. Because researchers in educational administration are philosophers as well as empirical inquirers, it is their understanding of theory and what such theory reveals of their identity in society, that requires them to adopt a critical stance towards both their theory and the concrete circumstances of their inquiry.

The attempt to bring together the more worthy elements of logical positivist and phenomenological philosophy has merit, but in doing so critical theory exposes itself to a number of objections. Like phenomenology, critical theory adheres to the distinction between science and hermeneutics but sees them as complementary. While this dualism is problematic enough, critical theory complicates matters further by introducing a third category of knowledge, that of reflection. The partitioning of knowledge into a trichotomous classification only raises further questions about the justification of the epistemic criteria employed to effect the division. The distinction between facts and values is similarly retained even if the two are intimately connected. The factual belongs to science while the evaluative resides in reflexive critique. Thus,

the autonomy of values is preserved; what is left unexplained is how values can have any traction on empirical states of affairs. Critical theory, like positivism and phenomenology, is also foundational, but unlike its rivals which ground inquiry in observation and interpretation (or meaning) respectively, Habermasian critical theory invokes cognitive interests, and three of them at that, to anchor knowledge. The theoretical necessity for, and the empirical status of, cognitive interests are troubling enough problems, but the positing of three such entities only magnifies the difficulty. While logical positivist theory examines structure and phenomenological inquiry investigates agency, critical theory endeavours to bring both structure and agency into partnership, but by treating them as a necessary dualism there is a failure to recognize that, because agency is structurally shaped and structure is influenced by agency, there is no dualism to be had. They merge into one. Likewise, the notion of the ideal speech situation and the associated universal pragmatics are also suspect. Since the ideal speech situation is exactly that, ideal, it cannot have been derived from empirical investigations into actual speech. Yet, if it has its origins in a particular theory of society this is no guarantee that the posited universal pragmatics will survive if the theory is replaced by another. Finally, although critical theory makes quite explicit the centrality of values, especially the social values of justice, fairness, and the like, these need not be linked to reflexive thought and ideological critique for their justification. Other ethical systems also invoke these very same values without grounding them in critical theory. So, while the values can be retained the rationale for them can be found elsewhere other than in critical theory.

Both positivism and phenomenology, on their own, seem quite inadequate to the task of providing a satisfactory philosophy for research in educational administration. Critical theory is certainly an improvement on them since it takes their better qualities but dispenses with their deficiencies. It goes beyond them to incorporate the appropriate properties into a wider and more comprehensive scheme. But it does so at the cost of a proliferated ontology, a partitioned epistemology, and a problematic axiological justification. Hence the emergence of a fourth philosophical position, naturalism, which seeks to achieve what all new theories aim for, namely, the elimination of older theories.

NOTES

- 1 Culbertson, 1980, 333; 1987, 1988.
- 2 Bills, 1963, 120. See Boyan (1988b, 79) and Pitner (1988, 118-9).
- 3 Although this section might give the impression that a coherent philosophical position emerged, this would be misleading. Rather, it represents no more than a bringing together of a number of loosely connected strands of argumentation by those who hold that research in educational administration must embody elements from both logical positivism and phenomenology.
- 4 Cummings, 1936, 78-83.
- 5 Culbertson, 1981a, 41.
- 6 Graff, et. al., 1966, 62.
- 7 Graff, et. al., 1966, 65; Hare, 1985, 67.
- 8 Hare, 1985, 67.
- 9 Hare, 1985, 109. The source of Hare's claim is to be found in White (1970).
- 10 Taylor, 1975, 218. This point is derived from Lukes (1973).
- 11 Hoyle, 1976, 4-5. See also Bush (1986, 101-4) and Riffel (1979, 202).
- 12 Taylor, 1984, 125-7.
- 13 Hills, 1980, 37.
- 14 Yeakey & Johnston, 1986, 172.
- 15 Battersby, 1986, 5; Culbertson, 1980, 345; Silver, 1983, 15.
- 16 Allison, 1983, 11 & 25; Bates, 1981b, 16; Bills, 1963, 120; Boyan, 1988b, 79; Boyd & Crowson, 1981, 319; Culbertson, 1980, 333; Hoyle, 1976, 4; Ianni, 1976, 13; Pitner, 1988, 118-9; Riffel, 1979, 203; Sergiovanni, 1984b, 279; Taylor, 1984, 125.
- 17 Allison, 1983, 9-11.
- 18 Bills, 1963, 118.
- 19 Bush, 1986, 104; England, 1985, 20; Foster, 1984, 154; Taylor, 1984, 128.
- 20 Allison, 1983, 11.
- 21 Hoyle, 1976, 5.
- 22 Taylor, 1984, 125.

- 23 Allison, 1983, 25; Culbertson, 1980, 341; Taylor, 1984, 125.
- 24 Boyd & Crowson, 1981, 319. See also Taylor (1984, 127 & 138).
- 25 Battersby, 1986; Gibson & Stetar, 1975, 19; Ianni, 1976, 13; Silver, 1983, 17. For a critique of craft theory, see Clark (1988).
- 26 Culbertson, 1980, 338-40; 1983, 19; Sergiovanni, 1984b, 279-80.
- 27 Culbertson, 1980, 340.
- 28 Gibson & King, 1977, 38; Gibson & King, 1977, 20-5.
- 29 Riffel, 1978, 144-6.
- 30 Bates & Miskel, 1983, 30-1.
- 31 Marx, 1951, 225. Quoted by Bates (1987, 89).
- 32 Bates, 1982, 1; Foster, 1980b, 498; 1986b, 64; Riffel, 1979, 200.
- 33 Bernstein, 1976, 228. Quoted by Foster (1980b, 496).
- 34 Foster, 1980b, 499.
- 35 Habermas, 1974, 216. Quoted by Foster (1980b, 499).
- 36 England, 1985, 23; Foster, 1980b, 503.
- 37 Bates, 1988, 110; Foster, 1986a, 124; 1986b, 31.
- 38 Bates, 1985, 28; Watkins, 1985, 3.
- 39 Foster, 1984, 256.
- 40 Bates, 1984a, 75.
- 41 Foster, 1980, 15-7; 1986b, 67.
- 42 Foster, 1984, 248.
- 43 Bates, 1982, 6. For a more detailed analysis of culture, see Bates (1987).
- 44 Foster, 1984, 253-4; 1985, 11.
- 45 England, 1985, 23; Foster, 1980b, 503; 1986b, 81-3; Watkins, 1983, 131.
- 46 Foster, 1986a, 104.
- 47 Foster, 1984, 249.
- 48 Foster, 1986a, 103; 1986b, 24.
- 49 Foster, 1980b, 499. However, as Evers (1988, 9) has pointed out, Habermas (1982, 274) has retreated from his earlier account of science: "In the light of the debate set off by Kuhn and Feyerabend, I see that I did in fact place too much confidence in the empiricist theory of science in *Knowledge and Human Interests*."
- 50 Bates, 1980a, 5.

- 51 Foster, 1984, 245; 1986b, 75.
- 52 Apel, 1967, 5.
- 53 Apel, 1967, 23; Quoted in Foster (1984, 245).
- 54 England, 1985, 24; Foster, 1984, 245; 1986a, 118; 1986b, 30; Riffel, 1978, 146.
- 55 Habermas, 1971.
- 56 Foster, 1986b, 74-5.
- 57 Foster, 1986a, 118.
- 58 England, 1985, 18; Riffel, 1978, 146.
- 59 Bates, 1985a, 14-5.
- 60 England, 1985, 17.
- 61 Watkins, 1983, 128.
- 62 Bates, 1982, 12; 1984a, 75; England, 1985, 22; Foster, 1984, 248; 1986a, 116; Riffel, 1981, 30-1.
- 63 England, 1985, 24.
- 64 Habermas, 1971, 310. Quoted in England (1985, 22).
- 65 Bates & Miskel, 1983, 7; Foster, 1984, 245; Watkins, 1983, 129.
- 66 Bates, 1982, 11; England, 1985, 23; Foster, 1984, 255; Watkins, 1983, 128-32. In administrative terms, how members of an educational organization may experience distortions of communication is documented by Watkins (1983, 131) with reference to Habermas's norms or universal pragmatics: "Is the administrator's communication *comprehensible*? Is the communicator's communication offered *sincerely*? Is the administrator's communication *legitimate*? and is the administrator's communication *true*?"
- 67 Foster, 1984, 255.
- 68 Bates, 1984a, 77; England, 1985, 25; Foster, 1984, 255; 1986a, 125; 1986b, 82; Watkins, 1983, 129.
- 69 Bates, 1982, 4; England, 1985, 25; Foster, 1980a, 12; 1984, 255; 1986b, 65; Riffel, 1978, 144; Watkins, 1983, 130-1.
- 70 Bates, 1982, 12; Foster, 1980a, 17; Riffel, 1978, 144; 1981, 29.
- 71 Riffel, 1981, 30.
- 72 England, 1985, 11; Foster, 1980a, 12.
- 73 Bates, 1985, 21; England, 1985, 25; Foster, 1980b, 504; Riffel, 1981, 30-2.
- 74 Foster, 1980a, 17; 1986a, 96.

- 75 Foster, 1986a, 12; Riffel, 1979, 200; 1981, 32-3; Watkins, 1983, 129.
- 76 Foster, 1986a, 103 & 124.
- 77 Bates, 1984a, 75-7.
- 78 Foster, 1986a, 124-5.
- 79 Fay, 1975, 103. Quoted in Foster (1986a, 124).
- 80 Foster, 1986a, 125; Watkins, 1983, 131.
- 81 Smyth, 1994.
- 82 Maddock, 1993, 1995.
- 83 Smyth, 1994, 4.
- 84 Bernstein, 1976.
- 85 Smyth, 1994, 2.
- 86 Smyth, 1994, 5.
- 87 Maddock, 1993, 1995.
- 88 Lakomski, 1987c.
- 89 Maddock, 1995, 61.
- 90 Habermas, 1990.
- 91 Maddock, 1995, 63.
- 92 Maddock, 1995, 62.
- 93 Maddock, 1995, 67.
- 94 Giroux, 1983.
- 95 Maddock, 1995, 64.
- 96 Adorno, 1978. It should be noted that while Adorno and Habermas are critical theorists they are not contemporaries. Adorno belonged to the first generation pre World War II Frankfurt philosophers, while Habermas is a post war philosopher.
- 97 Maddock, 1995, 65.
- 98 Maddock, 1995, 65.
- 99 Maddock, 1995, 65.

CHAPTER FIVE

PHILOSOPHICAL TRADITIONS OF RESEARCH INTO EDUCATIONAL ADMINISTRATION (4) : NATURALISM.

In his review of the three epistemologies then current in educational administration Culbertson¹, employing the Hegelian dialectic of thesis (logical positivism), antithesis (phenomenology) and synthesis (critical theory), concluded that with critical theory the theory debate had reached its pinnacle. However, with the advent of naturalism as a rival epistemology, Culbertson's verdict seems to be somewhat premature. The naturalist position in educational administration research actually consists of two rather divergent strands of thought. Willower,² influenced by such philosophers as Dewey,³ James⁴ and Peirce⁵ has appealed to the broad frameworks of naturalism, pragmatism and instrumentalism to sketch an alternative epistemology of pragmatic naturalist inquiry. Evers, Lakomski and Walker, attracted to Quine's⁶ philosophy of science and Dewey's⁷ pragmatic philosophy, have collaboratively embarked on a comprehensive research programme aimed at developing materialist pragmatism as a viable philosophical tradition for research in educational administration.⁸ However, despite the similarities between pragmatic naturalism and materialist pragmatism, their differences are such as to warrant separate treatment.

Although earlier philosophers such as Hume⁹ exhibited naturalistic tendencies, naturalized philosophy really only took hold in the twentieth century, first with Dewey¹⁰ and later with Quine.¹¹ Unlike the logical positivists who rejected metaphysics in all its forms for the strict canons of empirical science, Dewey acknowledged the compatibility of the two. On the metaphysical side, he recognized that even if all specific philosophical questions were claimed by science there would remain a realm of metaphysics dealing with more general questions applicable to the whole of science. Here he had in mind such notions as "*diverse existences, interactions, change* and

evaluations."¹² But consistent with his scientific naturalism, these general traits were not to be accorded special status over and above science itself. Dewey's conception of nature embraced both material objects and events as well as mind. The beginning point is always primary experience - the experience of a human being in the natural world. From our experience of things we generate reflective thought in response to puzzles, questions, uncertainties and so on as these bear on our making our way in the world. Our reflective thought arises out of primary experience and must be linked back to it if we are to determine whether it successfully addresses the puzzles and the like for which it was first advanced. For Dewey, primary experience did not mean 'sense data' as understood by the logical positivists. Rather, he held that sense data itself is merely the contact point with the world if our experience is to function as the source of empirical knowledge. Accordingly, the primary experience of experiencing subjects furnishes the data from which reflective thought is constructed. Our direct experience of a phenomenon is conceptually refined to extend our knowledge beyond sensory contact to reach theoretical understanding. Deweyan naturalism thus maintains the continuity of mind, knowledge, humans and nature; within the natural order humans have no higher standing than the rest of nature, being part of it yet never rising above it. According to Dewey, empirical naturalism or naturalistic empiricism represents the unity of nature and humans. What we are physically, our institutions, our culture, our experience are but "projections...of the nature which exists in the physical and pre-human world. There is no gulf, no two spheres of existence, no 'bifurcation' "¹³ Thus the main features of human life - human sufferings and enjoyments, successes and failures, art and politics, science and religion - are all features of nature itself, so that those who investigate such things are investigating aspects of nature itself.

On the question of whether naturalism is limited to yielding knowledge of physical nature (materialism) or is capable of generating reliable knowledge about what he terms 'mental' nature, Dewey settles for the latter. In order to do so, he distinguishes between two materialist doctrines, one of which he rejects. According to reductive materialism, the mental is identical with or nothing but the physical. As Dewey put it, "every psychological term is *synonymous with*, or has *the same meaning as*, some expressions or combination of expressions belonging to the class of physical terms."¹⁴ Dewey found little to be said in favour of reductive materialism. However, a second form

of materialism, which could be termed 'contingent' materialism, gained Dewey's support. This materialist doctrine maintained that "the occurrence of a mental event is contingent upon the occurrence of certain complex physico-chemico-physiological events and structures."¹⁵ Thus, the relation between the occurrence of particular mental states and the occurrence of physiological processes is a contingent or causal one. It may be possible to specify the physical conditions which correlate with mental states but any progress in this area will depend on future scientific achievement.

Dewey was also adamant that adoption of scientific method to generate reliable knowledge did not rule out the securing of knowledge about the mental. Again Dewey¹⁶ draws a distinction, this time between two different meanings of 'scientific method': the narrow sense of the term refers to 'a set of specialized techniques associated with various instruments each of which is appropriate for a limited subject-matter' while the wider notion picks out 'a set of general canons with the help of which evidence is to be gathered and evaluated'. Narrowly conceived, Dewey concedes that scientific method may well fail to probe mental nature; however, he asserts that this is not incompatible with the claim that scientific method, when broadly conceived, provides a set of principles adequate for appraising the evidence in both the physical and psychological domains.

However, it is the more recent work of Quine¹⁷ and the Churchlands¹⁸ which has had the greatest impact on the development of naturalized philosophy in educational administration. Quine's proposals for the naturalizing of epistemology and the Churchland's advocacy of eliminative materialism have been taken up by Evers and Lakomski¹⁹ in their formulation of a materialist pragmatism philosophy in educational administration.

PRAGMATIC NATURALISM²⁰

Although Willower has long been a critic of logical positivism, his particular version of naturalism nonetheless has strong links with the former, and he has on occasions expressed sympathetic support for many of the central tenets of this particular philosophy.

As to whether there is a world independent of our theories of it, Willower's view is lacking clarity for there appears to be some inconsistency in his use of the terms 'metaphysical realism' and 'empirical realism'. Willower argues that

from a philosophical perspective, the metaphysical question of an independent world cannot be resolved because the world is apprehended only through minds. However, evidence from fields such as astronomy, geology, and biology strongly implies that there is an independent world thus strengthening the position of metaphysical realism.²¹

Willower also claims that "one need not start out as a realist to accept the plausibility of a world independent of perceptions of it. Cumulative observations in the physical sciences quite strongly support such a hypothesis."²² But such a conviction is nothing other than empirical realism anyway, so it is not realism as such but rather metaphysical realism in particular which Willower rejects. The matter becomes even more confused when both forms of realism become muddled: " 'the scope of the natural universe is tremendously wider than the human experience on the basis of which it is known..' ' This form of 'empirical realism' posits an independent world, but on scientific not metaphysical grounds."²³ What is clear, however, is Willower's²⁴ rejection of metaphysical dualism in favour of naturalism - man is part of nature, in a community and of the world.

The connection between the objects of the world and our knowledge of them is problematic: on occasions Willower writes of a conflict between theory and the 'facts'²⁵ which implies that facts are things; elsewhere he remarks that facts are commonly defined as statements, not things, and goes on to claim that the argument that inquiry is wedded to a single reality and devoted to uncovering the 'facts' that constitute that reality is false.²⁶ Some clarity is restored in his adoption of Dewey's notion of knowledge as 'warranted assertibility' which requires that what is asserted is warranted by public evidence.²⁷ Knowledge is the product of inquiry; it is provisional and changing, never absolute, as new theories are created and evidence for them is assessed.²⁸ However, further ambiguity is evident in his account of truth: the distinction between correspondence and coherence theories of truth is such that the former "holds those propositions to be true that correspond with observed fact" while the latter "holds those

propositions to be true that harmonize with or fit a system of knowledge."²⁹ At times Willower claims that both are required;³⁰ on other occasions he suggests that it would be better to drop both and "simply argue that the process of inquiry and its cumulated conceptions and results provide grounds for the assessment of ideas."³¹ And on the distinction between the 'is' and the 'ought', Willower takes a decidedly positivistic stand. Denying that the emphasis placed on the dichotomy by Griffiths and Halpin was misplaced, he claims that description and normative statements are linguistically different; the separation of facts and values "enjoins us to recognize that asserting something is the case is quite different from asserting that that same thing ought to be the case. Appreciation of this difference is especially important in value laden areas like educational administration."³²

Schools, when understood as organizations, can be seen to be social systems³³ and it is by conceiving of them as social systems that we can come to a better understanding of them as organizations.³⁴ However, while schools are things in the world, organizations and social systems are not; they are concepts.³⁵ Like all organizations, schools maintain structures which serve stabilizing functions to reduce uncertainty through mechanisms of adaptation.³⁶ Thus, schools are bounded by norms or standards of behaviour which can be either explicit, taking the form of rules understood and accepted by members of the organization, or implicit, being understood but not articulated in any formal way.³⁷ Although, as noted earlier, Willower holds that the distinction between the descriptive and the normative is linguistically useful, he acknowledges that in administrative practice the two are thoroughly intermixed. Educational administration requires the making of decisions, many of which entail moral choices between competing goods. Practitioners must choose from opposing values and implement courses of action designed to achieve the desired ends.³⁸

Research into the administration of educational organizations, on the pragmatist naturalism model, should seek explanations which are both logically coherent and empirically viable.³⁹ Inquiry has two sides, the creative and the critical which blend "the freewheeling creation of ideas with critical efforts to disprove these same ideas."⁴⁰ Theories about educational administration are speculative explanations tentatively held, waiting to be disproved and replaced by new conjectures.⁴¹ The creative side is

characterized by thoughtful explanation, novel ideas, insightful hypotheses and speculative hunches; the critical element encompasses criticism, scepticism, verification and falsification.⁴²

The creation of knowledge ('warranted assertibility') about educational administration depends very much on the process of knowledge acquisition, referred to as the method of inquiry (Dewey) or the scientific method.⁴³ Since knowledge is neither more nor less than the product of inquiry, a theory of knowledge must assess both ideas and methods with scepticism according to public procedures of verification.⁴⁴ The espousal of a single process of inquiry, with the grounding of knowledge in inquiry, provides a conception of knowledge which is tentative and incorporates criticism as part of its method.⁴⁵

A fundamental principle in Willower's account of inquiry is that of theoretical and methodological pluralism; advances in educational administration will best be served by multiple ideas and methods where researchers are open to all sorts of possibilities. Every idea and method has its particular strengths and limitations, with some making more sense and being more useful than others. However, no perspective or approach can be ruled out in advance.⁴⁶

Theories consist of a series of logically interrelated generalizations, bound by neither time nor place;⁴⁷ theoretical generalizations have a high level of abstraction while lower level empirical generalizations touch upon specific experience. The latter provide the empirical grounding for, and may be deduced from, the former;⁴⁸ empirical generalizations thus function as explicit testable hypotheses which guide theory-based research.⁴⁹ Unless theories are connected, however indirectly, to observations of some sort, they cannot serve as hypotheses in research. Likewise, what is observed of administrative practice must relate to the theoretical abstractions which give meaning to the events and behaviour reported.⁵⁰ However, the extent to which the empirical hypothesis can provide evidence for a theory depends on the logical connection between them; unless the hypothesis is deduced from the theory, evidence generated by the hypothesis cannot stand as evidence for the theory.⁵¹ In the final analysis, theories remain as hypotheses (or conjectures) even when there is consistent evidence for them.⁵²

Hypotheses consist of concepts which are variables in empirical generalizations; concepts must be explicitly defined and logically connected (as in, for example, the proposition 'if p then q') with other concepts in the form of hypotheses if they are to have a function in research.⁵³ The meaning of a concept is defined by its operational use: "an operational definition requires that the observable conditions necessary for a concept's application be stated. The concept is said to be defined by the set of operations connecting it to conditions of observation."⁵⁴ While Willower expresses considerable support for the employment of operational definitions since they give precision and clarity of meaning to concepts and are essential if concepts are to have empirical reference,⁵⁵ he is nonetheless mindful of their limitations; they should not be taken as a final statement of meaning, and excessive narrowness of application through the dismissal of some important ideas as meaningless may be the price of precision.⁵⁶ The emphasis on this particular conception of meaning gives rise to a crucial question: "What operations did you actually carry out in your research to define the concepts you employed?"⁵⁷

On the source of theories, hypotheses and concepts, Willower's stance has certainly shifted over time in accordance with changing views on the matter. Initially, in a manner reminiscent of empiricism, Willower held that observation and description provided a rich source; concepts could be developed from observation, being formulated and reformulated as researchers used them to give meaning to their observations.⁵⁸ More recently, he has expressed the opinion that, contrary to the image of researchers thinking up tentative explanations from observations and testing them with further observations, science progresses by the framing of observations devised by those intent on trying them out and finding better ways of solving problems.⁵⁹ Useful concepts and theories can be adopted from any source and critical assessment made of their contribution to inquiry.⁶⁰ Hypotheses drawn from both a priori formulations and a phenomenological/subjectivist-oriented empathetic sense of administration are desirable. Whether the source be generalizations or empathetic insights is irrelevant; what matters is that theoretical explanations are generated which are clearly stated and open to public scrutiny and assessment.⁶¹

Concepts, hypotheses and theories are 'instrumentalities' functioning as

devices to focus observations and explain them.⁶² Observations of administrative practice are guided by and filtered through researchers' theoretical frameworks. In order to minimize personal bias and ideological commitment intruding on inquiry, various procedures have been adopted to ensure that, as much as possible, research is open to public criticism.⁶³ The critical side of inquiry embodies what Willower calls the 'verification' of hypotheses and theories which is unrelated to their contextual origins and their social/political consequences.⁶⁴ Since objectivity is unattainable, scientific norms must be adopted along the lines of those proposed by Merton⁶⁵ - universalism or impersonal criteria as tests of truth, communism or the common ownership of results, disinterestedness, and organized scepticism.⁶⁶

Hypotheses which have been tested are either rejected or supported by the evidence which is always partial, never final.⁶⁷ Where hypotheses withstand careful efforts to reject them, then confidence in the theory is increased, but no theory can be proven; rather, it is not yet disproved.⁶⁸ What counts as disproof of a theory is more problematic since scientific conclusions are provisional, always subject to revision, abandonment or replacement.⁶⁹ Despite the limitations of our theoretical interpretations of experience this does not logically entail a relativistic view of verification. On the contrary, some interpretations are better than others for "experience has demonstrated the superiority of one interpretation over another."⁷⁰

Since educational administration, as a field of practice, is beset with different kinds of problems, it follows that a variety of methods of inquiry is needed if these are to be properly tackled.⁷¹ Whatever method is employed, in the end what matters is whether the data generated "facilitates the creation of new concepts and conjectures that could function as hypotheses in further inquiry."⁷²

For both the researcher and the practitioner, the utilization of theory in administration is predicated on twin assumptions; the interconnectedness of descriptive and normative propositions and the application of the scientific method. The weaving of factual and evaluative judgements in moral choice about educational ideas and courses of action entails that administrators must be concerned with both the purpose of policy making and the means of implementation.⁷³ Translating ideals of what ought to be (particularly human aspirations, potentials, purposes, and human dignity)⁷⁴

into reality will be enhanced by an empirical understanding of educational organizations - in forming judgements about the implementation of moral choices, predictions must be made about the concrete consequences of various courses of action.⁷⁵ Conversely, there is an ethical dimension to estimates of alternative courses of action:

Is it likely that the alternative in question can be successfully implemented? What are the chances that the attempt to implement it will fail and leave the involved individuals and organization worse off than before? What are the potential side-effects and unintended consequences of the course of action, can they be dealt with or headed off as part of the overall implementation process?⁷⁶

Despite the fact that there is no necessary connection between knowledge and action, and that putting knowledge to use may often be difficult, theory and research nevertheless have potential for improving practice.⁷⁷ Since administrative judgements have to be made, then the most appropriate means of assessing the implications of knowledge for practice lies in the adoption of the scientific temper and the scientific method of reflective inquiry.⁷⁸ If they hope to improve the administration of educational organizations, then researchers and practitioners must jointly come to understand how and why such institutions work as they do. This may very well mean that in order for administrators to explain how things work in their own organizations they will need to embrace a variety of theories and concepts, particularly those of researchers which seek to explicate educational phenomena in abstract terms.⁷⁹ Such an approach provides administrators with the opportunity to employ ideas as hypotheses and test them out in their practice so that in their implementing courses of action, the self-correction of errors becomes a routine practice.⁸⁰ In practical terms, while the high level, abstract theoretical generalizations have wide application because of their generality, to be of use to administrators a connection must be established between such theory and the everyday world of people and events in the organization. Thus, theoretical generalizations must be reducible to empirical generalizations to illuminate the relationships among the variables of decision making. Through the application of generalized knowledge, educational administrators may become more aware of how their particular problems can be dealt with in a morally acceptable way.⁸¹

MATERIALIST PRAGMATISM

Materialist pragmatism, being a version of scientific naturalism, is both realist and monist in its account of reality.⁸² The world is material, consisting solely of natural entities such as familiar physical objects (eg. tables and chairs)⁸³ and ourselves, including our inner lives of psychological states and theories.⁸⁴ The social world of human behaviour is part of the natural world, not distinct from it;⁸⁵ metaphysical dualisms, especially mind-body, are eliminated by the reduction of each to physical entities.⁸⁶

On the realist assumption that we all share a 'common natural social situation', those committed to naturalism hold that it is important to gain the best knowledge we can of that situation.⁸⁷ Such knowledge is holistic, non-foundational, coherentist and fallible. Epistemic holism is grounded in Quine's⁸⁸ metaphor of a 'seamless web of belief': "knowledge...is a human made fabric or web which impinges on experience only at the periphery. At the centre, and far removed from any direct empirical contact are the most theoretical statements which structure the web."⁸⁹ Epistemology is naturalized so that there is but one form of knowledge - scientific knowledge - to which all other forms of knowledge are reducible.⁹⁰ In addition, the distinction between facts and values collapses, with both unified into a whole network of theoretical statements:⁹¹

If ethical statements (or hypotheses) are part of our web, with the web as a whole enjoying empirical support, then it is not possible to quarantine ethical statements as meaningless or in some way devoid of empirical content. Ethical terms can be regarded as having the same semantical status as other theoretical terms whose empirical significance is mediated by the web as a whole.⁹²

Value statements are thus incorporated into the whole network of theoretical statements that together must face empirical assessment. The defence of a value claim, as with all other empirical claims, is contained in showing how it is part of a theoretical network which is more coherent than its rivals.⁹³ The relationship between factual statements and value statements is demonstrably tight: firstly, values cannot be

excluded from science for, if ethical statements are held to be equivalent to statements at the more theoretical reaches of the network, they will, by providing a preference structure within which scientific knowledge is inescapably bound, determine the very direction in which the fabric develops and the kinds of problems to be researched.⁹⁴ Secondly, moral statements are part of a theoretical network which, as a whole, has empirical consequences. Revision of the network to accommodate unexpected consequences falls as much on value statements as it does on any other theoretical claims:

This holistic account of the theoretical unity of fact and value thus has the potential to take into its purview such humdrum administrative phenomena as the altering of very broad (moral) goals in the light of theories of what is achievable, and administrator moral development through learning by experience.⁹⁵

The epistemology of materialist pragmatism, unlike its rivals, is non-foundational. That is, it makes no appeal to some prior foundation to either justify its knowledge claims or to assess competing epistemologies. An epistemic argument for a claim is foundational if

It seeks to show that the claim to be justified follows, in some way, ultimately from a further claim or set of claims thought to be epistemologically secure. That is, broadly foundational epistemic arguments seek to justify knowledge claims by showing that they are derivable, in some sense, from a set of knowledge claims that are presumed to be not in need of justification.⁹⁶

While rival epistemologies locate support for claims in epistemologically privileged subsets of claims (empiricism - observations,⁹⁷ phenomenology - intentions,⁹⁸ critical theory - human interests⁹⁹), the assumption that our knowledge is in need of foundations is untenable as it has proven difficult to determine any suitable candidates which might serve as an adequate foundation for they can always be further challenged to justify their own foundations.¹⁰⁰ Materialist pragmatism denies that there are any epistemologically privileged subsets of more basic knowledge claims which justify our statements, for there is "a discrepancy between the reliability of some purported

epistemically privileged subset of knowledge claims that are to serve as a foundation for knowledge, and the epistemic reliability of the theory needed to identify and demarcate the required subset."¹⁰¹ Unlike its competitors, materialism pragmatism does not presume more than it is entitled to, on its own terms, in order to justify knowing.¹⁰² Rather, justification of a claim "resides in its being able to be incorporated into the most coherent conceptual scheme possible"¹⁰³ since the smallest epistemic units are whole theories.¹⁰⁴ Nor does the adjudication of contending epistemologies demand an appeal to a prior epistemology. All epistemologies are self-referential, but while others deprive themselves of additional resources by means of which they could further justify their presumptions, materialist pragmatism escapes a vicious circularity by recognizing equivalence between the principles of assessment of knowledge claims and the claims themselves:¹⁰⁵ "Put simply, 'proof' and 'claim' are epistemic equals,"¹⁰⁶ in the sense that they are both components of a single epistemological scheme. One is not logically foundational to the other.

Since non-foundational epistemologies cannot withdraw to secure foundations to stop the regress of justification, materialist pragmatism accepts a coherence theory of evidence which is to be distinguished from a correspondence theory of truth.¹⁰⁷ With the adoption of both a coherence theory of evidence rather than of truth¹⁰⁸ and a correspondence theory of truth,¹⁰⁹ 'truth' and 'correspondence' are central to the materialist pragmatism epistemology. Apart from the usual criteria relevant to assessing the quality of a theory (comprehensiveness, consistency, elegance, explanatory power, fecundity and simplicity¹¹⁰), coherence validates a theory as a theory such that "the internally most coherent, non-contradictory, explanation of a phenomenon is accepted as true."¹¹¹ However, once the coherence theory of evidence has done its work in adjudicating one theory's merits over and above its rivals, attention can then be turned to the preferred theory, by using its internal structure, to "determine the connection between sentences and the world; to determine, in short, the details of correspondence truth."¹¹² It is the whole theory that explains not only what exists but also how our language connects with the world such that the internal network structure must meet the requirements of Tarski's theory of truth.¹¹³ Given the 'web of belief' then it is fallacious to assume that 'truth' and 'falsity' only apply to factual statements such that

value statements can never be true or false:

If we reserve the word 'true' for statements making up the network we judge to be the best after the theory of evidence has done its work, then 'true' may apply univocally to all the statements of the network. Given a holistic theory of evidence, a felicitous parsimony obtains in being able to say that "'such and such a programme makes for human betterment' is true."¹¹⁴

Thus, all claims can be assessed true or false.

Since our knowledge is nothing more than the best theories available, it has no greater status than that of 'warranted assertibility'.¹¹⁵ Being the human product of ongoing, open-ended inquiry,¹¹⁶ knowledge must be regarded as provisional and fallible conjectures open to criticism and elimination:¹¹⁷

It has been commonplace, since Popper first began making the point, to regard all our scientific knowledge as provisional. We can never rule out the possibility of current theories being overthrown in favour of better ones. We can do no better than work within the bounds of our current best theories.¹¹⁸

Thus, knowledge that stems from inquiry changes as new theories are created and evidence on them is assessed.

A sophisticated theory of the object under study is needed which must be formulated prior to investigation, for without such a theory there can be no specification of what is to be researched.¹¹⁹ For the materialist pragmatist, the twin criteria of realism and materialism are powerful determinants of organizations. The espousal of a realist metaphysic means that organizations are not instrumental fictions but are real entities having the same ontological status as familiar physical objects.¹²⁰ The materialist nature of organizations is reductionist in the following way: materialism is to be understood in the same manner as 'matter' is used in the natural sciences, particularly biochemistry, in which the vital functions of living organisms are explicated in terms of chemical and physical processes. While a causal account of the genesis of the human species coheres with that of all living organisms, being part of nature does not require

that all organisms are alike. That there are significant differences between humans and other creatures can be attributed to the development of our large brains which have evolved and enabled us to learn and become self-reflective.¹²¹ Such a physicalist argument reduces the 'mind' to the physical properties of the brain and seeks to explain social phenomena in physical terms.¹²²

The physical world is all there is, composed of a vast network of causal regularity and an underlying causal structure present in people and their environment. It follows, then, that people's behaviour is causally connected to this network.¹²³ The assumption that a person's behaviour is caused whereby two items of behaviour are related with one being an antecedent cause of the other and the two linked by an underlying physical mechanism, points to the individuation of specific items of behaviour on the basis of "antecedent fine-grained electro-chemical neuro-physiological differences"¹²⁴ which account for their differentiation. Such an explanation is bedded in neuroscience within which the connections between neural processes, language use, behaviour and the external world are made. People's behaviour is causally linked to the extensive web of their previous learning and experience; in addition, their theories and reasoning can not only be a cause of their behaviour but are also reliable indicators of the causal antecedents of what they do.¹²⁵

Our everyday commonsense 'folk theory' about ourselves, couched in natural language propositional attitudes (eg. he *believes* p, she *desires* p, and so on) fails to cohere with the theoretical terms of causal explanation. Adoption of the intentional stance (in the technical philosophical sense of propositional attitudes as well as that of purposive behaviour) not only posits unobservable entities to explain observable behaviour, but the inference of the former from the latter precludes knowing whether the correspondence invoked between a specific observed behaviour and an inferred, unobservable, correlated and individuated propositional attitude which gives the behaviour its particular character is correct.¹²⁶ Coupled with this is the claimed autonomy of psychology wherein a sharp distinction is drawn between the reasons given for an act and causes of behaviour. However, a non-causal account in terms of intentions, reasons, desires and the like fails to explain how these propositional attitudes or mental states bring about or are associated with the relevant bodily

movements. Now, while folk psychology provides a commonsense general abstraction of specific engineering mechanisms of complex physical systems¹²⁷ (eg., writing a letter) and may make for a "more parsimonious, coherent and comprehensive account of persons, their activity, and their place in the world"¹²⁸ since it is reliable with some normal behaviour, it is nonetheless probably false as an explanation of a set of complex phenomena.¹²⁹ However, given the absence of anything near a comprehensive physical theory of behaviour one compromise lies in holding that propositional attitudes are rational causes distinguished by the descriptions we give them, but with advances in scientific knowledge about the brain the concepts of the intentional stance should be replaced by those of more systematic theories.¹³⁰ In other words, explanations of human behaviour couched in folk psychology terms must either be reduced to or, if this proves impossible, eliminated and replaced by natural science theories as these become available.¹³¹ In reducing dualist explanations of human behaviour to a materialist account, various versions of materialism including functionalism with its dualistic autonomy of psychology,¹³² identity theories which on a one-to-one basis reduce behaviour X to gene Y, and reductive behaviourism¹³³ are all rejected in favour of eliminative materialism.

Social organizations allow us to realize our interests, and the more we know of both the causes of our behaviour and the causal conditions required for their solution, the better placed we are to realize our interests. Within an educational organization, the unequal distribution of epistemic power of administrators over others places a causal constraint on the latter's behaviour if the former, having conflicting interests, know more about the causal conditions of a situation. Epistemic inequality differs little from other causal constraints in our natural/social world. Administrators have considerable epistemic and material power which may be beyond the capacity of others to control, even if those subject to this power are aware of the extent of this power, know why they themselves do not possess this power, and understand the causal changes required for them to gain some of this power.¹³⁴ Thus, the focus of educational organizations is on theorizing about and solving problems: concomitantly, educational administration consists of "educational practices and processes which are educational precisely because they happen in institutions and settings described as such."¹³⁵

Research into the administration of educational organizations, on the pragmatist materialism account, must be guided by recent developments in the philosophy of science and 'new' views of science. The smallest epistemic unit is 'whole theories';¹³⁶ the statements of a theory form a network - those statements central to the web, and most removed from direct sensory experience, constitute the most theoretical elements of the network, while those observational statements which employ singular reports of sensory experience lie at the periphery of the network.¹³⁷ However, no fundamental distinction can be drawn between observational statements and theoretical statements, for two reasons; in the testing of hypotheses, observational statements employ both theoretical terms and depend on a background network of theories.¹³⁸ Observations are 'theory laden';¹³⁹ theory always precedes observation and in Hansen's graphic illumination of the 'thesis of the theory dependence of observation',¹⁴⁰ "there is more to seeing than meets the eyeball."¹⁴¹ The theoretical terms in hypotheses and observational statements derive their meaning from their role in the whole network of theoretical statements, and not by virtue of the "intellectual straitjacket of operational definitions."¹⁴² The network serves as the mediator of evidence: where theory-laden observation reports presume an inadequate theory they may be ignored; on the other hand, where falsifying empirical evidence is accepted, network considerations determine which statements (or parts) of the system need to be adjusted or rejected.¹⁴³ Hypotheses do not correspond to a particular range of sensory experience, thus they cannot be simply refuted by observational reports.¹⁴⁴ Accordingly,

$$(H_1 \rightarrow O_1) \cdot \sim O_1 \rightarrow \sim H_1$$

is oversimplified. Rather, the test situation consists of the main hypotheses and supporting background hypotheses

$$(H_1 \& H_2 \& H_3 \& H_n \rightarrow O_1) \cdot \sim O_1 \rightarrow \sim H_1 \vee \sim H_2 \vee \sim H_3 \vee \sim H_n$$

since "our statements about the external world face the tribunal of sense experience not individually but only as a corporate body."¹⁴⁵ If $\sim O_1$, then any one (or more) of the hypotheses will need adjustment. Which one is chosen for revision will depend on which adjustments make for the most comprehensive and coherent network.¹⁴⁶ In the final analysis, the logical limit for empirical testability is that "any statement can be held

true come what may, if we make drastic enough adjustments to the system."¹⁴⁷ Thus, a hypothesis can, by methodological decision, be held true regardless of sensory experience.

However, a theory is always *underdetermined* by confirming evidence in that the same empirical evidence can support a variety of different theories.¹⁴⁸ Theory competition is a necessary requirement for the advancement of knowledge which presupposes both epistemic liberty and epistemic autonomy. Epistemic liberty is needed to formulate alternatives and assess them in open public debate so as to expose and remove epistemic weakness. Epistemic autonomy is the capacity to pick out and consider the strengths and limitations of rival theories:

Epistemic autonomy is necessary for the development of such theories; and epistemic liberty is necessary for the full productive development of epistemic autonomy. We all share interests in establishing the conditions for both the freedom and autonomy of individuals to develop their global theories and for an epistemologically open society in which the interaction of such theories contributes to the overall growth of knowledge.¹⁴⁹

Since all our experience is theory-dependent, there is no substantial difference between scientific theory and everyday commonsense theory. Rather, all theories are on an epistemic par; the only difference between commonsense theories and scientific theories is that the former are not as explicit or as systematically developed as the latter, but as science proceeds ahead of commonsense, the commonsense concepts which initially gave direction to inquiry can be sharpened, refined or even replaced by the precision and austerity of scientific explanations.¹⁵⁰ When theories offer competing solutions to a common problem, they are in competition with one another. What makes theory competition possible is *touchstone*, or shared hypotheses, standards and procedures of inquiry generated by the common situation and problems.¹⁵¹ Thus, points of agreement between competing theories must be identified for putting rival theories to theoretical and empirical test.

Since different epistemologies admit disparate items as knowledge and circumscribe the type of justifications possible, an adequate theory of knowledge must

not only create knowledge so that accurate accounts can be separated from inaccurate ones but also be able to justify our beliefs in a manner that does not "presuppose more in the epistemology we adopt as researchers than it can actually deliver."¹⁵² Unlike the theories of knowledge constitutive of logical positivism, phenomenology and critical theory which rest on observational sensory experience, empathetic understanding and cognitive interests respectively, materialist pragmatism denies any privileged foundations for inquiry.¹⁵³ The problem of foundational epistemologies is that the foundations themselves must be known to be reliable. In the case of logical positivism, epistemic privilege lies in 'observations'.¹⁵⁴ However, the difficulty facing logical positivism is that "its theory of what constitutes a legitimate set of foundations is, itself, not an observational statement. It is part of the network of hypotheses that is allegedly being supported by foundations."¹⁵⁵ Such a position generates epistemic circularity because the epistemological standing of the foundations (observations) hinges on the statements in need of foundational justification. A second difficulty arises with the grounding of justification in observations, namely, that while our senses are generally trustworthy, they can also mislead us: "it is possible for humans to see things, which are not there...or not to see things which do exist."¹⁵⁶ While physical phenomena stimulate our senses, our perception of them is also influenced by the way such experience is recorded in our brains which have been shaped by our past socialization, our expectations, and what we have learned.¹⁵⁷

Phenomenological inquiry, where knowledge is built on the foundations of 'understanding' or 'interpretation'¹⁵⁸ also runs into epistemic difficulties. Despite being expressed in the intentional idiom, interpretations are nothing less than networks of hypotheses or theories.¹⁵⁹ Our perceptions of our mental life, be they our understandings, intentions, reasons, motives or feelings, are no less theory-laden than our perceptions of the external world. Knowledge of our own inner world is neither 'immediately given' nor 'obvious'; rather, a whole network of theories is presupposed. However, such accounts remain at the level of description, not explanation. Since the aim of research is to offer the best theories available, such components of human subjectivity as introspection, consciousness and so on must "yield up their secrets to neuroscience."¹⁶⁰

A further difficulty arises out of the phenomenological acceptance of multiple interpretations. While the process of theorizing rightly includes the activity of those traditionally called 'subjects' - teachers and pupils - whose theories are epistemically equivalent, uncritically accepting people's own statements of their intentions, etc. is at face value an uncertain source of knowledge. The failure to appeal to some criteria for adjudicating between competing theories leads to relativism and the infinite regress of the hermeneutic circle.¹⁶¹ Unless there are criteria for assessing competing interpretations, there is no reason to suppose that interpretations can explain anything at all. Research which bases its findings on participant's understandings therefore claims more than it can validly justify, for it fails to spell out adequate criteria for judging theories.¹⁶² Procedures for choosing among competing theories will need to appeal to a modest standard of objectivity (encompassing the capacity to predict future courses of interpreted experience, solve our problems, mesh coherently with the scientific parts of our theoretical network) which has sufficient structure to permit the separation of good from bad interpretations (or theories).¹⁶³ Determining which theoretical explanation is the correct one is difficult, and may on occasions prove to be unachievable, but it is, in principle, possible to uncover the correct explanation which reveals the causes of events, etc.¹⁶⁴ In the end, the only means we have of assessing the respective merits of competing theories is their effectiveness in solving our problems. The criterion of whether we 'got it right' depends on "whether the problem which it was designed to explain is actually solved through our practice."¹⁶⁵

The foundationalism of critical theory is also rejected. For the materialist pragmatist, causal explanation is central to social inquiry, and by holding that causal explanations are every bit as interpretive as hermeneutic explanations, the distinction between the empirical/analytic and hermeneutic sciences is denied. Likewise, because ethical, political and evaluative considerations are derived from the network analysis of our material condition, the distinction between critical science and the other two sciences is also rejected. Thus, both narrowly conceived and partitionist epistemologies are mistaken.¹⁶⁶

Since materialist pragmatism does not lay down a priori what is to count as valid knowledge, it is rendered free to utilise any theory which appears useful for the solving

of a particular problem.¹⁶⁷ The apparatus for choosing among rival epistemological theories about the acquisition of knowledge is

no more than a broadly conceived, non-foundational, scientific method. Broadly conceived, because I see no a priori way of limiting the scope of science; and non-foundational, because there is no prior or basic epistemology to which we might appeal in order to adjudicate rival epistemologies.¹⁶⁸

Its strength lies in not having to declare any statement as having epistemic privilege prior to actual investigation taking place; rather, inquiry is a "constant process of matching up different and competing theories about a social practice or event."¹⁶⁹

The implications for methodology are as follows: epistemic theories are embedded in the research methods employed and the defence of results. Thus the preference of one category of methods over another lies in the supposition that the method(s) chosen will generate knowledge. However, no particular method can be ruled out in advance as irrelevant; to do so denies systematic open-ended inquiry, since scientific research, being non-foundational, can embrace any method with the potential for testing hypotheses.¹⁷⁰ Such an approach places an emphasis on the methods for dealing with a particular subject matter (in this case, educational administration) rather than in seeking universal objective traits which supposedly characterize the field as scientific. Accordingly, research into educational administration is defined as a science to the extent that it possesses "systematic methods of inquiry, which when they are brought to bear on a range of facts, enable us to understand them better and to control them more intelligently, less haphazardly and with less routine."¹⁷¹ The connection between research and administrative practice is particularly tight since all practice is theory-dependent, whether administrators acknowledge this or not.¹⁷²

Since what happens in educational organizations is nothing less than causally connected interactions, the only sort of theory which can lead to a satisfactory state of affairs is one which incorporates knowledge of the appropriate causal relations relevant to the problem(s) to be solved.¹⁷³ Because administrators are dealing with material beings in natural settings whose means/ends are causally connected, the notion of

control assumes primary importance in administrative and organizational arrangements. The practical interest in regulating human conduct is part of the wider kind of control which can be exercised over all natural entities: to understand human agency "is to understand the power to pursue ends and solve problems by controlling the relevant relations of cause and effect."¹⁷⁴ Because there is no difference between understanding human action and controlling non-human nature, there is no distinction between a *moral* interest and a *technical* interest; "a moral interest is a particular kind of technical interest, an interest in controlling human conduct in ways conducive to the general interest."¹⁷⁵ A concern for improving the human condition reduces to an interest in controlling the causes of the social injustices and 'oppressive social practices and structures' in order to eliminate them.

Since the capacity for effective problem solving is a primary human good then it is in the general interest for the growth of knowledge to continue. This has implications for researchers, administrators, teachers and students alike. Problem solving has to be learned, and it is learned through a scientific education where touchstone provides criteria for the assessment of competing ideas, plans, values, theories and behaviour. In short, all have an equal right, in the general interest, to express their points of view, with those in a position of control ensuing that this right is met in practice. Given that education is nothing less than learning problem solving through scientific inquiry, nowhere is this right more critical than in educational organizations.¹⁷⁶

While it is possible for all members' interests to be taken into account, it is clearly not possible for all to participate equally in administration of the organization. Leadership is required, which should be exercised in the general interest of promoting educative learning directed at the development of knowledge, problem solving capacity and the elimination of ideological beliefs. At the individual level, this entails the development of epistemic autonomy; at the institutional level, and about which administrators have a particular responsibility, it is the securing of the conditions of epistemic liberty, open practices and democratic structures.¹⁷⁷ Accordingly,

where learning, or the growth of knowledge occurs through problem solving, and problem solving is theorizing about cause-effect relations, fostering the conditions of learning is equally a matter of using the control

which constitutes leadership to make organizational learning a causal condition for getting the job done.¹⁷⁸

For the administrator, the diversity of points of view on policy and practice creates a wider field of possible solutions to problems. Research findings, being cumulative and reinforcing, lead to the formulation of connecting principles linking various administrative phenomena together under unifying laws to form a system or science: "it follows that any administrator who knows the system and its laws possesses a powerful tool for observing, interpreting, and ultimately changing, what goes on in educational practice,"¹⁷⁹ although, as Lakomski carefully points out, "better research is no *guarantee* for improved practice, but it certainly makes it a whole lot more likely."¹⁸⁰

EMERGENT LINES OF CRITICISM

Criticism of naturalism in educational administration research comes from two sources, one internal and the other external. The internal critique accepts the naturalist research programme but recognizes that there are gaps to be filled and revisions to be made if naturalism is to hold its own in the theory debate and as an adequate philosophy for research. This is the position adopted in this thesis. The external critical assessment of naturalized philosophy is far less sympathetic since it reflects the views of those who, committed to other philosophical traditions, find it seriously flawed.

From an internalist point of view there are a number of observations to be made, some general and others more specific. The first, not unique to the naturalist position in educational administration, is the fragmented manner in which this particular philosophical tradition has been made public. Although both the positivist and critical theory stances have each generated a substantial body of literature they have also set out in more systematic form the central principles and assumptions of research in their respective standpoints - Griffiths' *Administrative Theory*¹⁸¹ provides for positivism what Foster's *Paradigms and Promises*¹⁸² does for critical theory. Phenomenology and naturalism fare less well in this respect. Greenfield's¹⁸³ posthumous collection and that of Evers and Lakomski¹⁸⁴ consist more of previously published papers which, while critically examining other philosophical ideas, only offer piecemeal accounts of their

own positions rather than providing extended and systematic treatment of their own philosophical views. In the future, for phenomenology this may come from someone other than Greenfield, although perhaps the time for doing so has passed. But this seems less the case for naturalism since in educational administration it is still a developing philosophical position. In the absence of a current comprehensive statement on naturalism, this thesis goes some way towards filling this gap.

A second general concern, connected to the first, is that the unavailability of a systematic account of naturalized inquiry in educational administration makes it difficult to establish linkages between the various elements which have to date been presented in a variety of publications. It remains unclear, for example, how holism relates to learning and learning to neuropsychology. A methodical consideration of the related issues may help to bring further theoretical order to what is still a less than complete philosophical scheme. Apart from securing these theoretical links, there are also omissions to be dealt with. One in particular stands out. The naturalizing of ontology and epistemology are given due attention but the naturalization of axiology remains undeveloped and needs to be dealt with.

More specific issues warranting closer examination include the following. First, considerable weight is placed on touchstone as the basis for theory competition. Touchstone consists of shared hypotheses, standards, procedures of inquiry, and the like which rival theories can jointly appeal to. But this seems to concede too much. Some competing theories may not be too divergent and so they have a fair measure of commonality whereby one theory is perhaps relatively smoothly reduced to another. But other theories with a shared subject matter may be so conceptually dissimilar that their lack of any substantial agreement at all on the sort of touchstone could lead to the complete elimination of one by the other. All that these two rival theories might share could amount to little more than a limited set of basic observation statements about material objects. The notion of touchstone does not need to be invoked to account for theory competition, at least not in the way that it is formulated by some naturalist theorists. We can let touchstone go while holding on to whatever two rival theories might share. Since the nature of this shared content cannot be spelled out in advance it is unlikely that in all cases of rival theories will a touchstone of shared hypotheses,

standards and procedures be forthcoming. Whatever such theories may have in common will be determined on a case by case basis rather than by supposing they will always have full-blown touchstone. A second worry is the manner in which values are dealt with. Passing reference is made to a Deweyian view of values but this is never examined in any detail, nor does it seem to fit comfortably with the rest of the naturalized scheme. If axiological considerations are to be an integral component of a naturalized system then a case must be made for the naturalization of values. This is largely missing from the naturalist programme and must be dealt with. Therefore, a substantial section of this thesis is devoted to offering a naturalized account of values which connect with the rest of a naturalized framework.

The naturalist approach, especially that version of it which is materialist pragmatism (or naturalistic coherence), has been the target of a series of critical analyses from those committed to rival philosophical traditions: from the phenomenological or subjectivist quarter, Gronn, Hodgkinson and Ribbins have launched a number of substantial objections; Bates, steeped in critical theory, has cast doubts; employing a postmodernist approach, Barlosky has protested against its legitimacy; and Maddock, less easily classified but having apparent links with analytic philosophy, has raised some supposed difficulties. Some of these arguments overlap across the various strands of the challenge to a naturalized philosophy of educational administration research and, being well-made, warrant consideration. Other criticisms are more individually made and likewise merit some treatment. And some of the charges are so trivial and misplaced they deserve no further attention. The accusations against a naturalized form of inquiry in educational administration are these:

1. Naturalized philosophy is in error. According to Maddock¹⁸⁵ there is a distinction to be drawn between first-order theories such as the empirical theories of science and those second-order theories of philosophy. He denies that the evaluative criteria applicable to empirical theories are also those of philosophical theories because scientific theories are bound by empirical constraints whilst philosophical theories are not. Why, he asks, should philosophical inquiry be limited by the requirements of systematicity? Rather, it is by the unrelenting critique of all conceptualization that philosophy is able to work to inquiry's advantage in educational administration.

We might note, however, that to date no one has managed to provide an adequate justification for the distinction since empirical theories and philosophical theories are constrained by the same criteria which include empirical and conceptual considerations. Thus the distinction becomes somewhat blurred. Rather than being limited by systematicity, as theory philosophy is part of the systematic account we give of the world, and insofar as philosophy is thought to be no more than mere critique of conceptualization then it is not only critique of first-order empirical conceptualization but also critique of philosophical conceptualization. Furthermore, philosophical theory also engages with other theories and is both modified by them and contributes to their development. So philosophy goes beyond theory critique to participate in theory generation.

2. That naturalism, here conceived, despite its espoused postpositivism and anti-foundational character, nonetheless, inadvertently or otherwise, retains strong links with the philosophy of logical positivism since they both appear to share the prejudice that scientific knowledge is all there is to knowing and both aspire to reductionist explanations.¹⁸⁶ This connecting is made to be all the more plausible by virtue of the claim that "naturalism goes hand-in-hand with positivism."¹⁸⁷ Whilst naturalism is avowedly anti-positivist in its critique of positivist epistemology, that it should share some elements of positivist thought is not altogether surprising since both philosophical traditions have a common interest in promoting science, but this is insufficient to build the conceptual bridge the critics seek to establish. Further, the coupling of naturalism with positivism rests on a mistaken assumption that the bounds of positivism are, near enough, co-extensive with the bounds of science, so that any account of science will be positivist. But positivism, in its various guises, is but one theory of science and a poor one at that. There are many other theories of science, nonpositivist in character, which offer alternative and better accounts of the scientific enterprise. Naturalism is one of them.

3. Criticism has been heaped upon the naturalistic conception of science and epistemology. Most benignly, Willower¹⁸⁸ remarks that limited attention has been given to what he calls the "concrete, empirical side of knowledge-getting." Others¹⁸⁹ have expressed a similar concern that there has not been a comprehensive treatment of such

concepts as epistemology and theory of knowledge. Certainly, a more detailed explanation of the nature of naturalized epistemology and how a naturalized research process generates knowledge is both required and already available. More specifically, there is Barlosky's¹⁹⁰ objection regarding what he mistakenly attributes to naturalism - 'benchmark observations' which he thinks are required to achieve the objectivity and realism which a naturalized philosophy demands. He is of the view that these so-called benchmark observations would need to be theory-neutral rather than theory-dependent, and so he asks how are they to be separated? Short of them being irrefutable empirical givens, which runs counter to the naturalist maxim of the theory-ladenness of all observation, then it seems that these benchmark observations cannot be anything other than theoretical. Hence, there is a contradiction. However, acceptance of realism does not entail a class of privileged empirical observations quarantined off from the rest.

It is from our sensory experience that we posit things to account for our experience - what we posit is given us by our theories. That there is no ontological primacy of evidence over observation does not, contrary to Barlosky's claim, lead to problems about realism for the positing of a real world is the best theory we have to explain our sensory experience. Our observation sentences being our entering wedge to the world, are theory-laden, hence fail to be benchmarks in Barlosky's sense. But they are more than this. They are objective insofar as they secure the agreement of observers over what the sentences refer to and whether they are true.

The success of science is linked to the above points. It is not successful just because, instrumentally, in many instances it assists in the survival of the human species, nor because it has been found to work, as Maddock¹⁹¹ would have it. Important as these are, the success of science can also be explained, at least in part, by its connection with weak realism - the positing of a real world of directly experienced objects provides a reasonably compelling and efficacious explanation as to why our theories make the accurate predictions that they do. They do so because there is a real world upon which they get their bite. But the denial of the success of science will not wane. For Gronn and Ribbins¹⁹² the search for a 'better' science to 'traditional' science rather than 'an alternative to science' signals a failure to capture Greenfield's insistence

on the inclusion of feelings and values. But a 'better' science can and does embody them, and embodies them well. Maddock¹⁹³ goes further: naturalistic science assumes that scientific knowledge is all there is to knowing, thereby asserting rather than establishing that this is so. But if our knowledge consists of a seamless web of theory with an empirical edge of observation statements held together by a network of more abstract theoretical principles, then it seems not unreasonable to conclude, not that science fails to establish its own superiority, but that it is and can only be close to the full extent of our knowledge. To assert the superiority of science, in order to establish it, is not to beg the question. It is to answer it, making use of our best theories to show that they are all we have. This, then, leads to Barlosky's¹⁹⁴ challenge: to give away the word 'theory' with its implication of universal truth, and replace it with the postmodern alternative 'narrative' connoting local, contingent and authored knowledge. This would permit what he calls the verisimilitude or lifelikeness of narrative rather than the generalized truths of theory, and encourage the emergence of new forms of knowledge. Science would be reduced to a narrative, and a poor one at that, because its claims to universal truth would be inconsistent with the more limited requirements of narrative's localized truth. Lying behind this epistemic pluralism is the notion of 'contending intersubjective realities'.¹⁹⁵ But, as a naturalist might rightly reply, such a characterization of theory is but a caricature. Theory does not necessarily deal in universal truth, merely truth. Theories can be about particular things and are thus non-generalizable. Further, if our first theories are the first patternings of our brains then theories far outstrip narratives and are non-reducible to them. More problematically, the notion of verisimilitude or lifelikeness of narrative smuggles in some version of a correspondence theory of truth. Against what, and how, is the lifelikeness of narrative to be arrived at? As for emergent new forms of knowledge, different from and superior to science, how they are ever to become, and remain, autonomous, adrift from the simple empirical observation sentences of natural science, is one unexplained mystery. The epistemic foundation of their demarcation from science and one another is a second. And their assumed superiority is a third. As for 'contending intersubjective realities', if these are no more than competing theories of the world then the problem remains at the level of epistemology and the question of their adjudication is contained. But if what is meant is a matter of ontology, that there really are different actual worlds, distinct from

different theories of the world, then such a notion borders on the unintelligible. Barlosky's version of postmodernism might thrive in such a muddled environment; naturalized science does not. On the face of it, an actual world and infinite possible worlds has more going for it than multiple actual worlds.

4. There has been considerable dissent expressed over the super-empirical virtues employed by naturalized philosophy in the adjudication of rival theories. Granting, with the naturalists, that some-such criteria are required, there is nonetheless disquiet over the inclusion and status of these virtues. Forming a coherent set, the virtues are, not exhaustively, the following: simplicity, fecundity, coherence, comprehensiveness, parsimony and conservatism. Gronn and Ribbins¹⁹⁶ claim that the terms used to convey these virtues are poorly defined - their meanings are not self-evident but are 'essentially contested'. Certainly, there is a need for such words to be given clear meanings, and this can be done even in the absence of universal agreement. Maddock,¹⁹⁷ while agreeing with the criticism about vagueness, raises questions over several of the virtues. Of comprehensiveness - is it always preferable that a theory should deal with a wide range of situations rather than a narrow one? No, not necessarily at the expense of other virtues which may on occasions be accorded greater weight. No, not if a narrow range is the most comprehensive achievable. Of conservatism - should a new theory always be anchored to existing theory, or are there occasions when a radical departure from existing theory will enhance scientific advancement? Maddock is right to point out that conservatism can at times be a serious obstacle and radicalism may be an appropriate response. But then, naturalism does not deny this at all; rather, it embraces it. Of simplicity - if the world is complex, then why is a simple explanation preferable to a complex one? A simple explanation would misrepresent the complex nature of things.¹⁹⁸

Unfortunately, this criticism trades on different meanings of the term 'simplicity'. For the naturalist, simplicity as an epistemic virtue is about logical simplicity, or the least number of assumptions required to explain something. In this sense, a simple theory may, paradoxically, be complex as befits its subject matter. Maddock is also concerned that there appears to be no indication of how the various virtues are, at any one time, to be aggregated, and how they are to be comparatively weighted. There is no formula for

doing so, but there are useful rules of thumb, based on experience, to guide us, albeit fallibly. As to their status, the virtues are not, as Barlosky¹⁹⁹ assumes, self-evident. Rather, from within a naturalized standpoint the virtues, being theoretical, are, like all theoretical entities, the product of theory and practice and are, like all theoretical formulations, eminently revisable.

5. The emphasis on, or more strongly perhaps, the promotion of, a naturalistic reduction of the mental to the physical, or of the mind to the brain, is deemed to be plainly wrong. The naturalistic project of eliminating propositional attitudes and the attendant folk psychology from explanations of human behaviour is held to be both simplistic and misguided. For Bates²⁰⁰ the reduction of the social to the psychological to the biological to the physical leads to a total denial of the social. However, naturalistic reduction is not of this order at all; it is also a fallacy to assume that the physicalism or materialism of a naturalized philosophy rules out the social. It does not - what it entails is a major redescription of the social in rather different theoretical terms. The structure of organizations is shaped by the enduring dispositions embedded in the brain and acquired through learning. Gronn and Ribbins²⁰¹ seek proof of this while Maddock²⁰² questions whether naturalism has yet to determine how people learn. On the first, proof seems an inappropriate requirement - evidence is perhaps more appropriate. On learning, a naturalistic account is rapidly being developed. Despite having a naturalistic bent and expressing strong sympathies with the overall programme, Willower likewise has misgivings about physicalism, not finding it particularly useful in cultural studies. However, Walker's *Louts and Legends*,²⁰³ is an ethnographic study conducted within a naturalized mode. Willower goes on to remark that one of the joys of doing cultural research is to generate plausible explanations with limited physical evidence - this is precisely what naturalized inquiry seeks to achieve, but in physicalist rather than the mental-state terms so widely used in educational research. Gronn and Ribbins²⁰⁴ remain unconvinced that because 'folk' explanations have given way to more powerful scientific theories in other branches of inquiry they will also crumble in the explanation of human behaviour. Recent developments in cognitive science, philosophical psychology and neurophilosophy now go well beyond the promissory note, although many of the finer details required for a full account of human learning and behaviour in

administrative contexts remain outstanding. Finally, the claim by Maddock²⁰⁵ that a naturalized science is, following Quine, behaviouristic, is completely wrong. Our theories, whether epistemological, ethical or otherwise, must be in keeping with our best empirical theories, but our best empirical theories are those of neural networks and parallel distribution processing of cognitive science, not behaviourism. Even Quine acknowledges this.

6. The naturalization of ethics, and more generally values, is also thought to be misdirected. Both Greenfield²⁰⁶ and Hodgkinson²⁰⁷ argue that naturalism places too great an emphasis on epistemology to the detriment of axiology, on truth rather than goodness.

Ethics has a central role in any naturalistic theory of the world. Hodgkinson²⁰⁸ in particular has been a vocal opponent of the naturalistic enterprise in ethics since he seeks to retain the traditional distinction between the is and the ought, thereby distinguishing science from ethics. There is, he claims, no reciprocity between the two: science can serve as 'evidence' for ethics and set its boundaries; but while ethics can limit science by setting its bounds it can never provide the 'evidence' for science. Of ethical properties, such as good, they are simple and non-natural: "the distinction claimed by the human species to render itself ontologically other than the rest of the animal kingdom is that...mankind *has* moral capacity. It can do ethics....A most peculiar 'non-natural' capacity when one reflects upon it."²⁰⁹ The attack against the naturalist denial of the is-ought dichotomy and the naturalistic fallacy seems misplaced. From a naturalistic point of view, the Humean fact-value dualism is seriously weakened even if it does not collapse altogether, while ethics can on occasions serve as 'evidence' for science, and ethical properties are more natural than Moore cared to admit.

To be sure, the Quinean account of the nature and acquisition of values has problems, as Maddock²¹⁰ suggests. It fails to provide an adequate normative theory and some naturalists recognize this. Hence the formulation of a more powerful naturalized theory of value is required consistent with our best empirical theories.

Such, then, are the sorts of critical observations which have been levelled against naturalized research in educational administration. There will probably be more

to come as this philosophical position continues to press its claims for pre-eminence over its rivals. Rather than deal with these existing objections, one at a time, which would consist of no more than a series of one-off refutations, the time has come to take Maddock's observation seriously that naturalism is "nothing less than a complete philosophy, containing specific epistemology and related ethics, a theory of human nature...all of which are integrated within a comprehensive web of belief,"²¹¹ and proceed to make good the claim by providing a systematic account of philosophy, epistemology, ontology and axiology naturalized. In what follows, these and other matters are traced out in detail to provide a systematic naturalized philosophy to underpin research in educational administration and, by extension, in all other branches of educational inquiry. It is largely philosophical, making little direct reference to educational administration as such. What is attempted is a reasonably full explication of the most basic philosophical assumptions of such research. Once this has been completed, the implications of naturalized philosophy for research into the administration of educational organizations will be considered.

NOTES

- 1 Culbertson, 1981b.
- 2 Willower, 1981, 134.
- 3 Dewey, 1938.
- 4 James, 1975.
- 5 Peirce, 1958.
- 6 Quine, 1960, 1964, 1969a; Quine & Ullian, 1978.
- 7 Dewey, 1929.
- 8 In spelling out materialist pragmatism in more detail, Evers (1987b, 11) claims "the approach has much in common with the pragmatism of John Dewey, especially his naturalism and his emphasis on problem solving and epistemological holism, but rejects Dewey's instrumentalism and theory of truth." Evers goes on to note that in eschewing Dewey's ideas of instrumentalism and truth, he and Walker "follow the more realistic pragmatic tradition developing out of the work of Quine."
- 9 Hume, 1888.
- 10 Dewey, 1929.
- 11 Quine, 1969a.
- 12 Smith, 1978, 144.
- 13 Dewey, 1979a, 360.
- 14 Dewey, 1977b, 388.
- 15 Dewey, 1977b, 389.
- 16 Dewey, 1977b, 392.
- 17 Quine, 1969a.
- 18 Churchland, 1986; Churchland, 1989.
- 19 Evers & Lakomski, 1991.
- 20 The term 'pragmatic naturalism' is not Willower's; it was coined by Evers (1987a) to refer to Willower's work.
- 21 Willower, 1982a, 5. This empirical claim does, however, beg the question. Further, Willower (1982a, 5-6; 1985b, 8) also concludes that the plausibility of

metaphysical realism is irrelevant to both educational administration and philosophy of science - what matters is whether there is any order in the world.

- 22 Willower, 1980, 25.
- 23 Willower, 1980, 22. The quote is from Feigl (1947, 371).
- 24 Willower, 1981, 129.
- 25 Willower, 1979a, 65.
- 26 Willower, 1982a, 5-6.
- 27 Willower, 1981, 117; 1985b, 9.
- 28 Willower, 1981, 117 & 129.
- 29 Willower, 1979a, 65.
- 30 Willower, 1979a, 65; 1986b, 135.
- 31 Willower, 1986b, 135.
- 32 Willower, 1982a, 9. See also Willower (1988, 736).
- 33 Willower, 1964, 98; 1965, 40; 1973, 7; 1979a, 74.
- 34 Willower, 1979a, 74.
- 35 Willower, 1979a, 70; 1980, 13. According to Willower (1979a, 70) organizations, social systems, gravity and force are all on a par - they are concepts, not things. He also thinks that it would be hard to find anyone today who would contend that an organization is a thing. Evers (1986, 5) is one who certainly does.
- 36 Willower, 1973, 7; 1979a, 74.
- 37 Willower, 1965, 41.
- 38 Willower, 1985b, 14-5; 1985d, 13; 1988, 735-6.
- 39 Willower, 1979a, 77; 1980, 18.
- 40 Willower, 1979b, 20. See also Willower (1985b, 8).
- 41 Willower, 1980, 1.
- 42 Willower, 1985b, 8. Further, Willower (1979a, 66), influenced by Popper's (1959) falsificationism, argues that no evidence can be conclusive; increasing the number of confirming instances does not prove an observation statement to be true; nor is the possibility of it being true increased (Dimmock, 1980a, 45). Falsification, unlike verification, adds to the truth content of observational statements (Pratt, 1980, 55). Yet, in his analysis of the relevance of Popper's philosophy for educational administration, Corson (1987, 30) notes that
 in the 1960s Popper changed the orientation of his theory in a subtle but important way: He moved his stress from 'falsification' as the central point in his research process, and placed it instead

on 'error elimination'....His change of emphasis from 'falsificationism' to 'error elimination' is not as well known as his original idea and therefore people are prone to believe that they are familiar with Popper's views when in fact they are not.

For a response to Corson, see Dolmage (1988) and Corson's (1988) reply.

- 43 Willower, 1964, 90, 1988, 742.
- 44 Willower, 1985b, 12.
- 45 Willower, 1985d, 8; 1988, 742.
- 46 Willower, 1985b, 9; 1986d, 43; 1988, 744.
- 47 Willower, 1980, 1.
- 48 Willower, 1963a, 47; 1975b, 83.
- 49 Willower, 1963a, 50; 1979b, 34.
- 50 Willower, 1964, 99; 1986b, 135; 1988, 731.
- 51 Willower, 1975b, 83-4.
- 52 Willower, 1986b, 135.
- 53 Willower, 1963b, 109; 1975b, 83.
- 54 Willower, 1963b, 107.
- 55 Willower, 1963b, 108; 1979a, 66; 1979b, 33; 1980, 10; 1982, 12-3; 1985b, 11. According to Willower (1979b, 33), "logical positivism has contributed much to science through efforts to clarify language and procedures. Its emphasis on operational definitions has been especially helpful in the social sciences." Elsewhere, he also claims that "operational definitions are something scholars of every persuasion use whether they are aware of it or not" (Willower, 1985b, 11).
- 56 Willower, 1963b, 107-8; 1982a, 12.
- 57 Willower, 1982a, 13.
- 58 Willower, 1963b, 102.
- 59 Willower, 1985b, 7; 1988, 730.
- 60 Willower, 1988, 731.
- 61 Willower, 1985b, 12. He goes on to remark (p.12) that despite the philosophical deficiencies of phenomenology, there has been a positive aspect to its influence in educational administration by reminding us of the importance of the personal, and of empathetically understanding others in their terms. Such a view is a considerable improvement on his earlier claim (Willower, 1964, 88) that explanation and understanding must be grounded in general relationships.
- 62 Willower, 1983, 188; 1985d, 16; 1988, 738.
- 63 Willower, 1963b, 102; 1983, 188; 1988, 742.

- 64 Willower, 1963b, 106; 1982a, 26.
- 65 Merton, 1973.
- 66 Willower, 1982a, 26; 1988, 742.
- 67 Willower, 1963a, 47.
- 68 Willower, 1979a, 66; 1979b, 20.
- 69 Willower, 1985b, 8.
- 70 Willower, 1988, 742-3. See also Willower (1982a, 26; 1985b, 9).
- 71 Willower, 1988, 732 & 742.
- 72 Willower, 1988, 733.
- 73 Willower, 1964, 91; 1982a, 10; 1985b, 15.
- 74 Willower, 1964, 94.
- 75 Willower, 1982a, 10; 1983, 191; 1988, 737.
- 76 Willower, 1985b, 15-6.
- 77 Willower, 1979a, 77-9.
- 78 Willower, 1964, 90; 1979a, 77-9; 1983, 90.
- 79 Willower, 1979a, 79; 1988, 745.
- 80 Willower, 1983, 190.
- 81 Willower, 1964, 89.
- 82 Walker, 1987, 3.
- 83 Evers, 1988, 7.
- 84 Walker, 1987, 3.
- 85 Lakomski, 1985a, 54; Walker, 1987, 3; Willower, 1981, 129.
- 86 Evers, 1987b, 18; Lakomski, 1987c, 96; Walker, 1987, 3; Willower, 1981, 129.
- 87 Walker, 1987, 3.
- 88 Quine & Ullian, 1978.
- 89 Evers, 1985, 45.
- 90 Evers, 1987b, 14; Lakomski, 1985a, 51; Walker, 1987, 3; Willower, 1985d, 8.
- 91 Evers, 1987a, 65; 1988, 11; Lakomski, 1985a, 61.
- 92 Evers, 1987a, 65.
- 93 Evers, 1988, 11.
- 94 Evers, 1985, 44-6.
- 95 Evers, 1988, 1.

- 96 Evers, 1987a, 54.
- 97 Evers, 1987a, 65.
- 98 Lakomski, 1987b, 128.
- 99 Lakomski, 1987c, 91.
- 100 Lakomski, 1987a, 153; 1987b, 130.
- 101 Evers, 1987b, 13.
- 102 Lakomski, 1985a, 36.
- 103 Evers, 1985, 45.
- 104 Lakomski, 1985a, 52. In response, Willower (1986b, 135) points out that what constitutes 'a whole theory' is not always clear for even single hypotheses can be viewed as 'whole theories'.
- 105 Lakomski, 1985a, 52.
- 106 Lakomski, 1985b, 19.
- 107 Evers, 1988, 6; Lakomski, 1985b, 20.
- 108 Evers, 1987b, 11.
- 109 Evers, 1988, 11
- 110 Evers, 1988, 6; Lakomski, 1985b, 20.
- 111 Lakomski, 1987a, 154.
- 112 Evers, 1987b, 11.
- 113 Tarski, 1944. While Evers '(1988,7) account encompasses both coherence and correspondence, Willower (1986b, 135) writes:
 One difference lies in Lakomski's adoption of a coherence theory as her sole test of truth. To use terms that are somewhat dated, why not seek both coherence and correspondence?....In any case, it seems better to drop the terms coherence and correspondence.
 In fact, Evers and Lakomski accept a coherence theory of evidence and a correspondence theory of truth.
- 114 Evers, 1988, 11.
- 115 Willower, 1981, 117.
- 116 Lakomski, 1987a, 154; Willower, 1979b, 33.
- 117 Evers, 1988, 13; Walker, 1987, 3-4; Willower, 1981, 117. The influence of contemporary philosophers of science, particularly Popper, is acknowledged by both Evers and Walker.

- 118 Evers, 1988, 13.
- 119 Walker & Evers, 1986, 384.
- 120 Evers, 1988, 7. However, for a naturalist who holds to an instrumentalist view that organizations are concepts, not things, see Willower (1979a, 70; 1980, 13).
- 121 Lakomski, 1985a, 53.
- 122 Lakomski, 1985a, 61.
- 123 Evers, 1988, 18.
- 124 Evers, 1983, 2-3.
- 125 Evers, 1987b, 19.
- 126 Evers, 1983, 12; Lakomski, 1987a, 153.
- 127 Evers, 1988, 18.
- 128 Evers, 1987a, 70.
- 129 Evers, 1987b, 19.
- 130 Evers, 1987a, 71.
- 131 Evers, 1983, 2; Walker, 1987, 3. See also Churchland (1979) and Stich (1983) to whom Walker refers.
- 132 Evers, 1987b, 19.
- 133 Lakomski, 1985b, 20.
- 134 Walker, 1987, 7.
- 135 Lakomski, 1985b, 19.
- 136 Evers, 1987a, 64-5; Lakomski, 1985a, 36; 1987a, 154.
- 137 Evers, 1988, 5.
- 138 Evers, 1985, 45; 1987a, 64.
- 139 Evers, 1987a, 64; 1988, 5; Lakomski, 1985b, 18; 1987a, 154; 1987d, 13.
- 140 Lakomski, 1987a, 154; 1987b, 131; 1987d, 13.
- 141 Hanson, 1958, 7. Quoted in Lakomski (1985a, 47).
- 142 Evers, 1987a, 64-5; 1988, 6.
- 143 Evers, 1988, 6.
- 144 Evers, 1985, 45; 1987a, 64. Quoting Quine (1964, 437-42).
- 145 Quine, 1964, 41. Quoted by Evers (1985, 45). See also Evers (1987a, 64).
- 146 Evers, 1985, 45.

- 147 Quine, 1964, 43. Quoted in Evers (1987a, 43). See also Evers (1985, 45).
- 148 Evers, 1988, 6.
- 149 Walker, 1987, 4.
- 150 Evers, 1987a, 71; Lakomski, 1985b, 18; 1987a, 156.
- 151 Walker, 1987, 3.
- 152 Lakomski, 1987b, 116. See also Lakomski (1987a, 147-8).
- 153 Lakomski, 1985a, 35-6.
- 154 Evers, 1987a, 65; 1985a, 46.
- 155 Evers, 1987a, 65,
- 156 Lakomski, 1987a, 153.
- 157 Lakomski, 1985a, 47.
- 158 Evers, 1986, 16; Lakomski, 1987a, 152; 1987b, 128.
- 159 Evers, 1988, 16.
- 160 Evers, 1987b, 16.
- 161 Lakomski, 1987a, 153.
- 162 Evers, 1988, 16; Lakomski, 1987a, 154.
- 163 Evers, 1987a, 70; 1988, 16.
- 164 Lakomski, 1987a, 154.
- 165 Lakomski, 1987a, 154. See also Evers (1987a, 70), Lakomski (1987b, 132) and Walker (1987, 3).
- 166 Walker, 1987, 4.
- 167 Lakomski, 1985a, 52; 1985b, 18.
- 168 Evers, 1987a, 70.
- 169 Lakomski, 1987a, 154; 1987b, 131.
- 170 Lakomski, 1985b, 19; 1987a, 148.
- 171 Dewey, 1929, 8-9. Quoted in Lakomski (1985a, 55).
- 172 Lakomski, 1987d, 14.
- 173 Lakomski, 1987a, 148; Walker, 1987, 5.
- 174 Walker, 1987, 5.
- 175 Walker, 1987, 7.
- 176 Walker, 1987, 8.
- 177 Walker, 1987, 11-2.

- 178 Walker, 1987, 14.
- 179 Lakomski, 1985a, 56.
- 180 Lakomski, 1985b, 22.
- 181 Griffiths, 1959.
- 182 Foster, 1986b.
- 183 Greenfield & Ribbins, 1993.
- 184 Evers & Lakomski, 1991.
- 185 Maddock, 1994, 14-5.
- 186 Barlosky, 1995b, 2; Maddock, 1994, 23.
- 187 Maddock, 1994, 8.
- 188 Willower, 1993, 154.
- 189 Gronn & Ribbins, 1993, 167.
- 190 Barlosky, 1995a, 8-10.
- 191 Maddock, 1994, 8.
- 192 Gronn & Ribbins, 1993, 165.
- 193 Maddock, 1994, 23.
- 194 Barlosky, 1995a, 14.
- 195 Barlosky, 1995a, 9.
- 196 Gronn & Ribbins, 1993, 166.
- 197 Maddock, 1994, 12-4.
- 198 See also Barlosky (1995a, 11-2) who, quoting Greenfield (1987, 7) that "our conceptions of organizations must be as complex as the reality we try to understand," makes the same point.
- 199 Barlosky, 1995a, 7.
- 200 Bates, 1993, 174-5.
- 201 Gronn & Ribbins, 1993, 167.
- 202 Maddock, 1994, 24.
- 203 Walker, 1989.
- 204 Gronn & Ribbins, 1993, 166-7.
- 205 Maddock, 1994, 24.
- 206 Greenfield & Ribbins, 1993, 268-9.
- 207 Hodgkinson, 1993, 177.

- 208 Hodgkinson, 1993, 178-9. See also Gronn & Ribbins (1993, 165) and Maddock (1994, 7).
- 209 Hodgkinson, 1993, 179.
- 210 Maddock, 1994, 24.
- 211 Maddock, 1994, 24.

CHAPTER SIX

THE NATURE OF PHILOSOPHY AND PHILOSOPHY NATURALIZED

Now that the central features of each of the four main traditions of research in educational administration have been laid bare, it is clearly evident that the debate over their relative strengths and weaknesses is very much a philosophical one. Although the substantive issues of the arguments have been well rehearsed, little has been said about the nature of the philosophical task itself. This is indeed unfortunate on two grounds; not only are there competing views of philosophy at work, the merits or otherwise of which need to be addressed, but it must also be recognized that the philosophical work in educational administration (and elsewhere) is very much guided and shaped by the views of philosophy held by the philosopher and non-philosopher participants alike.

THE NATURE OF PHILOSOPHY

To a considerable extent the answers given to the question 'What is philosophy?' by those engaged in the debate have been shaped by mainstream philosophy rather than philosophy of education. Although many of the commentators have participated in the philosophical discourse, albeit to varying degrees of involvement, few have ever attempted to explain quite what the philosophical task entails. All too often a particular philosophical tradition has been embraced unaccompanied by any awareness of how the tradition has its roots in an on-going philosophical controversy about the nature of philosophy itself.

The building of a philosophy would need to deal with at least three central philosophical problems - the metaphysical problem of what is real, the epistemic problem of our knowledge of what is real, and the axiological problem of the values fundamental to practice. For those in the theory movement, influenced by logical positivism, a sharp distinction was drawn between philosophy and science. Griffiths¹

took the 'is-ought' dichotomy as the basis of his claim that whereas science is primarily a matter of theory construction and is factual, philosophy is more concerned with the development of a set of oughts or values. While Griffiths, like Butler,² recognized that the formation of a set of values necessarily involves the other branches of philosophy, he nonetheless made it clear that it was science, and only science, not philosophy, which could contribute to the growth of theories.

Although the phenomenologists, notably Greenfield, employ philosophical arguments and refer to Kant and Wittgenstein among others, there is very little discussion of philosophical methods. The work of Husserl,³ a founder of phenomenology as a modern school of philosophy, remains largely unacknowledged. Nevertheless, Greenfield,⁴ by blurring the differentiation of facts and values, collapses the distinction between philosophy and science; it is not only scientists who can interpret reality - philosophers have been doing so for years. Wittgensteinian⁵ logic provides a vision of the world by offering metaphors and images as keys to understanding: "These images are of the same kind as those hidden in the theories or models that social scientists build to explain human behaviour. Both the images and the theories provide reservoirs of meaning for interpreting our experience."⁶

For critical theorists, philosophy is rooted in the dialectical thought of Hegel and Marx.⁷ Although the nature of philosophy and its relation to the sciences remains unexamined, some connection may be presumed since facts and values are held to be inextricably intertwined, and 'administration is philosophy in action' for philosophy involves a set of beliefs about how the world is structured and how administrators put these beliefs into action.⁸

The naturalistic response is more lucid. While Willower⁹ concurs with Griffiths that the great questions of metaphysics, epistemology and ethics bear heavily on educational administration, his remark that both philosophy and science are human creations¹⁰ fails to clarify the philosophical task. It is left to Evers and Lakomski to do so. Although their materialist pragmatism can be seen as a reaction against the other philosophical traditions in educational administration, it must also be located in the context of philosophy of education since its origins lie in a rejection of analytic philosophy of education (APE) so dominant from the early 1960s onwards. Within

philosophy in general and philosophy of education in particular, the analytic tradition has had a profound influence on philosophical thought, although those in educational administration appear to have been little touched by it.¹¹ Following the pull of the revolution in philosophy, one of the most determined attempts to develop an analytic philosophy of education (APE) can be found in the work of Peters with its emphasis on the analysis of concepts as a second-order activity. In an effort to elucidate the necessary and sufficient conditions for the use of various concepts, each concept was often considered in isolation, disconnected from the other concepts of the theory of which it formed a part. The philosophical task was seen to be different in kind from other modes of inquiry: whereas science is a first-order activity where "a scientific question... is one that can, in principle, be answered by certain kinds of procedures in which observation and experiment play a crucial part" philosophy is a second-order activity which, in relation to science, focuses on "the clarification and discussion of the concepts used and how they have meaning, and of the procedures by means of which these questions are answered."¹² The challenge to APE came from Marxists¹³ and, more importantly for our purposes, from Walker and Evers' materialist pragmatism.¹⁴ For the latter, philosophy, more broadly conceived, dispenses with the analysis of conceptual meanings and the analytic-synthetic distinction in favour of theory construction where philosophical and scientific endeavours, being continuous, bear directly on theoretical-practical problem-solving. Eschewing the 'neutrality' of APE, Walker and Evers¹⁵ have openly espoused a naturalism both materialist and pragmatic with explicit implications for educational policy and practice.

PHILOSOPHY NATURALIZED

The sharp contrast between ordinary language and that of science, so often drawn by analytic philosophers (of education) is surely overdone. While there are important differences between the two linguistic forms, their similarities are too great to treat them apart. The emphasis on ordinary language to the detriment of science, and vice versa, runs contrary to the evolution and learning of language. Commonsense and science are continuous: science evolves from commonsense in a self-regulatory and critically systematic manner while ordinary language is revised in the light of improved theoretical science. The extension of science beyond ordinary language arises out of

the latter's interest in everyday communication rather than with a concern for rigorous precision and clarity; but let it not go unnoticed that on matters of theoretical dispute we can always be driven back to the basic observation sentences of the broader linguistic community of ordinary language users to reach agreement. Equally, ordinary language rides on the back of scientific progress; the most basic of our commonsense utterances - observation statements about physical objects - are nothing less than very elementary empirical sentences of science. Further, even a cursory examination of the evolutionary nature of ordinary language reveals its infusion by the theoretical language of science. To be sure, the continuity of ordinary language and science is not always smooth, for in places their connection is decidedly disjointed, but what goes for parts is not extrapolative to the whole. In the end, however, the point of science is to go beyond commonsense, to refine it where possible and replace it where necessary. So, contrary to ordinary language philosophy, the position to be advanced here places greater weight on the language of science as the means of coming to know the world.

The central, unifying role of language in everyday, scientific and philosophical activity is important to establish. Quine,¹⁶ immensely impressed with Neurath's metaphor of the ship at sea, to which he frequently alludes, likens language to a boat which, if it is to be rebuilt, must be done so plank by plank while remaining afloat. The boat remains afloat because each new plank keeps the craft intact; so too, each revision of the linguistic structure keeps the bulk of it as a going concern. Just as there is no alternative but to keep the boat afloat so too there is no alternative but to continue to use our current language, the best we have at the time. The ordinary person, the scientist and the philosopher are all together in that we must make do with whatever linguistic resources we have, revising our talk here and there but keeping the whole as a going concern. The relation of commonsense, scientific and philosophical discourse is of a kind; commonsense, the refined commonsense which is science, and epistemology are all part of the overall linguistic scheme, none logically prior to the others but all mutually connected. Just as the mariner cannot step off his boat, neither can we step outside of our conceptual framework. Linguistically, there is nothing so basic as our ordinary talk of physical things for "our ordinary language of physical things is about as basic as language goes."¹⁷ However, our ordinary talk of physical things can be

extended by establishing connections between such talk and the theoretical language of science and philosophy which are meaningful with the help of ordinary language.

The quest for a first philosophy, standing outside of science and logically prior to it, has a long and continuing history. Having its origins in the assumption that it would be viciously circular to use science to justify science itself, traditional foundationalist epistemology has sought to ground science in such external epistemic norms as reason (rationalism), sensory experience (empiricism) and linguistic analysis (positivism) in order to establish the conditions for the possibility of all knowledge. Whatever the foundation, each school of thought has claimed that its account is the sole source of epistemic norms; yet, whatever their differences, and there are many, all are agreed that science itself cannot provide the norms of science since, it is argued, something cannot be used to justify itself. Rather, the norms of science must lie outside of science. However, justification of first philosophy itself is an impossible task. Science tells us that reason alone cannot inform us of the external world; it also tells us that sensory experience is part of science itself; and it tells us that language has its very roots in the physical objects of primitive science. There simply is no epistemology more secure than science itself - the search for some epistemically privileged class of absolute, non-scientific truths to sustain science must be abandoned. But to foresake traditional epistemology is not, ipso facto, to repudiate epistemology altogether. There is still naturalized epistemology, continuous with science, being part of the holistic linguistic network.

Naturalized epistemology, like traditional epistemology, is both descriptive and normative; unlike foundationalism these twin aspects are grounded in science itself. Science is fallible and open to revision, requiring no warrant beyond that of observation to ground theory and a broad hypothetico-deductive framework to account for experience. Epistemology of a naturalistic kind does two things: **(1)** to describe and explain how we as humans construct our elaborate theories of the world from our meagre sensory stimulations, using science to investigate the acquisition of science - it goes without saying that our scientific explanations of science as a social process are no better than the very science they seek to explain but, being continuous with science, they are nevertheless able to draw upon what ever theoretical and evidential support

science can muster, and (2) to normatively elicit the epistemic criteria required for revising the global theory we take as a going concern. Normative epistemology is naturalized as part of science; it certainly is not dispensed with. The normative principles of epistemology, the supra-empirical virtues, and the supreme normative principle of normative epistemology, the primacy of empirical inquiry over soothsaying, telepathy and the like, arise out of the ongoing scientific process itself, being empirical in content, not a priori. In short, normative epistemology is simply part and parcel of evolving science.¹⁸ The naturalist - layman, scientist or philosopher - seeks to improve the system from within, accepting that the means available for doing so are restricted to those of the system itself. In other words, the naturalistic epistemologist is free to use whatever scientific resources there are available within the methodological constraints and normative standards of science.¹⁹

A naturalistic epistemology stands in marked contrast to that of traditional analytic philosophy. It does not seek to establish the necessary and sufficient conditions for the truth of such claims as 'S knows that p' where S knows p if and only if p is true, S believes p to be true, and S is justified in believing that p is true. Conceptual analysis, as a philosophical method hived off from empirical considerations, is dispensed with. No longer is epistemology detached from the empirical theories and findings of science; now, scientific theories about neural processing, perception and language acquisition become available to epistemology. Since the central question of epistemology becomes one of how our theoretical talk connects to our observational talk, a theory of learning is the key to developing an adequate theory of knowledge.²⁰

Quine's notion of semantic assent and his denial of 'first philosophy' assume, as we shall see, a central role in naturalism. The impact of both logical positivism and, more lately, various forms of linguistic analysis on philosophy and philosophy of education is evident in the way both of the latter have been conceived. The distinction drawn between analytic and synthetic statements, the primacy of meaning over truth, and the search for indubitable foundations for mutable inquiry combined to erect a barrier between philosophy and science which was duly carried over into education where the job of philosophy was to analyze concepts, clarify meaning and provide a secure epistemic bedrock for science, while empirical investigation to establish truth

was the province of the sciences. But can the separation of philosophy from science (and with it the separation of philosophy of education from other branches of educational inquiry) be sustained? Clearly not.

The blurring of the distinction between analytic and synthetic sentences, given the doctrine of holism, means that there is no class of analytic statements within which philosophy can be contained - philosophy, like science, is concerned with synthetic statements and is therefore continuous with science.

The distinction drawn between meaning and truth, such that before a statement can be declared true its meaning must be understood, was taken to reflect the division of labour between philosophy and science. The role of the philosopher, on this view, is to clarify the meanings of scientific statements and construct the linguistic framework of science; that of the scientist is to determine the truth or falsity of such statements and to build theories using the language made available by philosophical analysis. Such an account gives subsequent legitimation to the epistemic or logical priority of philosophy over science by defining the boundaries of theoretical investigation (and what may be established as true or false). However, the learning of words depends on learning them in true sentential contexts - to grasp the meaning of a word is to truly apply it regardless of whether the sentence is observational or not. Ultimately, to grasp the meanings of words depends on a prior understanding of the truth conditions of the sentences containing them.²¹ It would thus appear that analytic philosophy is further undermined.

The laying down of a 'first philosophy', prior to and epistemologically firmer than science itself, presupposes both the possibility of establishing a suitable foundation without recourse to empirical or theoretical language about the world, including humans as language users, and of somehow being able to grasp how the foundation is firmer and more secure than our sensory observations of physical objects. However, there can be no prior philosophy - it is from science itself that epistemology emerges.

If the relation between philosophy and science, traditionally conceived, breaks down, what then is the connection? They are continuous since both are parts of a holistic network of theoretical statements variously connected to observation sentences. But more, science like philosophy has a concern for words. Science is

particularly concerned with what there is, with what objects to accept (but so too, in its own way, is philosophy). Such talk remains empirical. But when our talk moves from nonverbal entities (sticks and stones) to more abstract things, we begin to talk of words almost to the exclusion of nonlinguistic things. The shift from the material mode (talk of education) to the formal mode (talk about "education") is the switch from talk using particular terms to talk about these terms themselves. Yet it is a mistake to conclude that factual considerations about things in the world apply only to our talk within the material mode while considerations of the successful use of the linguistic network, or systematic efficacy, pertain to the formal mode. The effectiveness of our linguistic system holds in both cases - the one tacitly, the other overtly so. Likewise with objects; considerations of things are, for both, indispensable. That semantic assent is the property of philosophy alone is nothing but a legacy of the thesis that there are analytic sentences which are the concern of none but philosophy - rather, the strategy of semantic assent applies everywhere, including the sciences. In the end, there is very little to distinguish the philosophical scientist from the scientific philosopher. The philosopher can occupy no vantage point outside of the conceptual scheme which the scientist, mathematician and layman use. All work from within to investigate and improve the theoretical system of science, mathematics and commonsense. The connections between science, mathematics and philosophy are such that in their combined efforts to clarify things they differ little in their aims and methods. What distinguishes philosophy from the other branches of inquiry is but a matter of scope: what physical objects there are is for scientists to decide, and whether, for example, there is a class of prime numbers is for mathematicians to decide, but whether there are physical objects or classes at all is a matter of ontology, a matter of "making explicit what had been made tacit, and precise what had been vague; of exposing and resolving paradoxes, smoothing kinks, lopping off vestigial growth, clearing ontological slums."²² This is where philosophy comes in. Thus, in the final analysis, the question of what there is is a shared concern of philosophy and the sciences, natural and social insofar as we care to distinguish them.²³

Although the finer details of the continuing arguments in philosophy, philosophy of education and educational administration over the nature of philosophy and its

relation to science need not detain us, it is important to at least spell out the sort of philosophical task which lies ahead. Philosophy, like all forms of inquiry, is circumscribed by the formulation of and competition between rival theories, for it is theories and theories alone which make inquiry possible. The construction of theories is central to the philosophical enterprise since concepts obtain their meaning not individually but by virtue of their interconnectedness within a theoretical network of concepts. It is the network as a whole which provides a concept with whatever meaning it has. Thus, the meaning of a concept is given, not by the necessary and sufficient conditions of its a-contextual use, but by its place in a theory, and a concept may change its meaning as the theory changes.²⁴ Theory competition eliminates any epistemic privilege which may be claimed by rival philosophical theories. It is not that "any departure from the common sense point of view requires justification";²⁵ rather, ordinary language explanations are theories on an epistemic par with other theories and they too require justification. All theories, commonsense and scientific alike, are provisional and fallible; like all theories, those of ordinary language philosophy must hold their own in competition with rival theories. The supposed separation of philosophical analysis and empirical inquiry in education, supported by the analytic-synthetic distinction, is far less secure than may be supposed. Empirical inquiry, while observational, is theoretically driven, for all observation is theory-laden; conceptual investigation, theoretically construed, is no more immune from empirical revision. Nowhere is this more clearly evident than in neurophilosophy.²⁶ Although there is a difference between science and philosophy in that science involves direct investigation of the world and philosophy investigates language, philosophy does not investigate language rather than the world. It investigates the world through the investigation of language. Since there is much to be learned about things by investigating our talk about them, science and philosophy are each continuous with the other in the search for encompassing descriptions and explanations of the way things are.

Although the influence of Quine's systematic philosophy is evident in the elucidation of the position set out in this thesis, two points should be noted. First, Quine's own position has not remained static. He has modified some of his views in the light of criticism directed at some of his more controversial claims. In a number of places

Quine has been confronted by sustained argument from sympathetic and antagonistic commentators alike. In his many replies, Quine has re-asserted those assumptions he holds inviolable, yet has been willing to concede those points which he recognizes to be weak, in error or in need of revision. To some extent much of the criticism of his early work has been answered either by counter-argument or by making the necessary adjustments to his system to accommodate well-made contrary opinion. All of this is clearly evident in a series of critical commentaries and Quinean replies.²⁷ Much of this, plus Quine's²⁸ more recent writings, have been taken into account in reaching my own position. Second, while my account remains reasonably close to Quine's on many but by no means all aspects of ontology and epistemology, it diverges significantly from his on the elimination of the mental as well as on the nature of values. Contrary to Quine, a case is made for eliminative materialism and the naturalizing of values consistent with the broader naturalization of ontology and epistemology.²⁹

In conclusion, our knowledge of the world has no prior epistemic base grounded in some incontrovertible substructure such as observation, innate ideas or intuition. Since there is no foundational knowledge there is no epistemic privilege which might secure philosophy a special status. On the contrary, science and philosophy are continuous and possess the same epistemic features. Hence, no sharp distinction is to be drawn between facts (empirical statements) and values (philosophical judgements) nor between the so-called social and physical sciences. There is a unity of inquiry. What follows for educational administration is that there cannot be any special theory of the field which is hived off from our global theoretical network. Rather, research in educational administration must conform to the very same canons of science demanded of all inquiry. In the next four chapters each of the central philosophical problems will be dealt with in detail to reveal how a particular version of naturalism is able to handle them in a coherent manner.

NOTES

- 1 Griffiths, 1959a, 15.
- 2 Butler, 1957, 15.
- 3 Husserl, 1970.
- 4 Greenfield, 1977, 96.
- 5 Wittgenstein, 1923.
- 6 Greenfield, 1979a, 106.
- 7 Foster, 1984, 240.
- 8 Foster, 1986, 19.
- 9 Willower, 1981, 115.
- 10 Willower, 1985, 7.

- 11 Note, however, McPeck's (1985, 8) remark that as a first step in the preparation of educational administrators he would suggest, as they do in England, a substantial grounding in philosophy of education, with such central concepts as 'role', 'bureaucracy', and 'organizational structure' replaced by concepts like 'training', 'indoctrinating' and 'educating'.
- 12 Peters, 1966, 16.
- 13 Harris, 1977; Matthews, 1980.
- 14 Evers, 1988; Walker, 1988; Walker & Evers, 1984.
- 15 Walker & Evers, 1984.

- 16 Quine, 1960, 3; 1966, 210. The metaphor is perhaps most clearly expressed in Flanagan's picturesque account: there being no other place to occupy than the deck of logic itself while repairing our linguistic ship,
 we spend much of our time examining the internal structure of our ship, admiring or deriding the aesthetic quality of the design. Such examination corresponds to those checks on our scientific, epistemological and ethical theories in terms of their internal logic - for example, in terms of consistency or simplicity. Of course, logical elegance is not all that we care about. There is the matter of staying afloat. Some constructions provide roomier, more comfortable lodgings and overall happier, safer, less treacherous and rough trips. It is this latter sort of feedback, mediated by the shell of the ship, which the sea gives to Neurath's boat that nature

nonmetaphorically gives to both science and ethics. The feedback about the quality of our predictions and practices is never perfectly clear due to the mediation of our conceptual and ethical schemes.

Although Quine makes considerable use of Neurath's boat metaphor, Hookway (1988, 64) suggests that it could be developed in two rather different ways. The first version consists of a sprawling structure encompassing both our commonsense beliefs and our scientific understandings. Over time, the structure grows with the addition of new opinions and empirical discoveries while some components of the system are revised or eliminated. The second version, accommodating Quine's portrayal of physicalism, along with theories other than physical theory (e.g. chemistry, biology, economics, history) which would not figure in the conceptual scheme. Hookway does not see these two accounts as necessarily in competition. It could be that scientific method and philosophical analysis will lead to the first reducing to the second, but the 'rich, familiar boat' will be reduced to a 'refined, honed down racing model'. Yet, Hookway asks whether Quine's austere version is preferable to the expansive account. Clearly, physicalism does not demand that the only theory worthy of the name be physics. Physicalism can just as easily accommodate other scientific theories which Quinean physicalism rejects. In this sense, the term 'materialism' seems a more appropriate expression to use, having wider coverage than Quine's more austere image of science.

17 Quine, 1960, 3.

18 Quine, 1990b, 229. The naturalizing of epistemology is a project rejected by traditional epistemologists. Stich (1993, 2) observes that traditional epistemology pursues three particular goals: justification of strategies of knowledge formation and revision; definitions of knowledge which distinguish it from belief, opinion and the like; and refutation of the skeptic's argument for the impossibility of knowledge. The criticism against naturalized epistemology has been two-pronged; some have claimed that such an epistemology is unable to provide epistemic norms, others that it fails to answer the skeptic's challenge.

To address the skeptic's challenge first. Stroud (1984) claims that naturalized epistemology does not adequately deal with the problem of skepticism because in grounding epistemology in natural science it is precisely this justification which is in question. We cannot, says Stroud, use science to justify science, for if doubt is raised about our ability to know anything about reality then we cannot at the same time employ the resources of science to secure epistemic certainty. As Hookway (1988, 56) put it, "since the credentials of science are being challenged by the skeptical argument, it is question begging to assume the truth of scientific results in framing a reply." From within traditional epistemology, this indeed is the case. But does it apply to naturalized epistemology? A two-fold response can be given: (1) it is a mischaracterization of skepticism to think that it is divorced from science, for skepticism about science presupposes science. Skepticism trades on illusions, but like counterfeit money and real money, illusions are recognized as such against a

background of real objects. Something is an illusion because we know it to be other than what it appears. So, if the skeptic can make use of science to reject science then a defender of naturalized epistemology likewise is free to use all the resources of science to justify science; (2) the skeptic's challenge to naturalized epistemology presupposes science in a second way. Epistemology is not free-floating but is constrained by ontology, as the argument for reciprocal containment demonstrates. Epistemology presupposes science since it presupposes the existence of an external world, it presupposes contact with the external world through our sensory mechanisms, and it presupposes that evidence is obtained from science. The skeptic makes use of all three, and as Gibson (1988a, 59) notes, by doing so "uses a portion of science to bring doubt on science, but only by presupposing the truth of other parts of science." So the skeptic's challenge is blunted by naturalized epistemology, and, interesting as the challenge is, insofar as science is a going concern then the skeptical worry is not a paralyzing one.

By far the strongest of the two major objections to naturalized epistemology is the argument that while traditional epistemology is normative naturalized epistemology is merely descriptive, so is incapable of providing epistemic norms. In assessing the validity of the objection we need to begin with traditional epistemology - what it is and how the norms are justified. Haack (1990, 199) states the position thus: "A traditional conception takes the central task of epistemology to be the explication of *epistemic concepts*, central among which...is the concept of epistemic justification...and the ratification of criteria for justification....The traditional approach conceives these projects as distinctly philosophical in a strong sense; they are to be undertaken, not by any kind of empirical undertaking, but a priori." Critics of the naturalizing of epistemology point to the descriptive, empirical or scientific character of naturalized epistemology and, invoking the is-ought distinction, query how a purely explanatory account of how we arrive at our theoretical system from sensory experience could possibly generate epistemic norms necessary for the justification of epistemic claims. Putnam (1982, 15), for example, claims that the disquotational theory of truth - 'to call a statement true is just to reaffirm it' - entails the dismissal of normative epistemology. But this conclusion seems to be wrong since the 'tribunal of experience' which underpins this conception of truth will anchor whatever account of 'true' we employ. In other words, truth will remain a norm irrespective of the meaning given the predicate 'true'. Lauener thinks that naturalized epistemology is doomed to failure because the normative aspects cannot be deduced from describing what epistemologists, scientists and others actually do. His claim is that methodological debates about scientific procedures are not themselves scientific but instead belong to the realm of metascience. Questions about scientific means and ends, value terms needed for criticizing and revising empirical theories, the criteria for theory acceptance, and so on cannot be addressed by science, but only by metascience which is clearly separated from scientific matters. According to Lauener (1990, 215) "we have to make a distinction between science and metascience, since the claims of the former can only be justified 'from without', i.e. by evaluating them from an external, practical point of view." This assertion rests on an appeal to first

philosophy which raises troubling questions about the status of a priori principles of justification. There simply seems to be no way of our standing apart from our general empirical system in order to evaluate it - the only standards we have are those of science and we can appeal to none higher. The norms applied to evaluate science are, from within our global theory, the norms of science itself. The norms are not given a priori but arise out of ongoing scientific practice, and the only way to evaluate the current norms of scientific inquiry is to assess the practice of science, by pragmatically accepting what works.

Stich (1993, 1-5) also rejects the 'naturalizing of epistemology', at least in what he calls the strong sense of the term. Naturalist epistemologists urge that empirical science has an important role to play in epistemology but the issue which divides strong naturalism from weak naturalism is the extent to which naturalism can resolve the matter of epistemic justification. Strong naturalism maintains that all epistemological questions fall within science while weak naturalism claims only that some of these questions do so. Stich holds Quine's naturalism to be of the strong variety, and as such is incoherent. On one interpretation of the strong thesis, Stich takes Quine to be saying that psychological questions can replace traditional epistemological questions: 'How do people actually go about forming beliefs and building theories on the basis of evidence?' instead of 'How ought we to go about it?' Stich rightly enough concludes that this is not the best interpretation of Quine's thesis - he is right because this simply is not Quine's position. Stich offers another interpretation which he finds just as implausible. He claims that while the naturalized epistemologist can investigate the means by which different people arrive at their empirical beliefs on the basis of the available evidence, there is no way in which the epistemologist can provide normative advice to judge the merits of these competing world views. However, Stich's characterization simplifies naturalized epistemology to the extent that he ignores several crucial elements. It is quite untrue that the naturalizing epistemologist cannot adjudicate between competing theories. Appeal is made to a robust conception of truth and to 'the tribunal of experience'. Truth is normative, not merely descriptive. And as will shortly become plain, naturalists are able to appeal to other norms as well in order to justify epistemic claims. Furthermore, there appears to be no strategy for arriving at the norms of inquiry in advance of inquiry itself. Rather, the norms arise from ongoing scientific practice as Stich (1993, 5) readily concedes: "If we can characterize the reasoning strategies that good researchers employ, then we will have a descriptive theory that has some normative clout." For Quine, good reasoning strategies are those which generate predictions which turn out to be true.

Seigel (1980, 1984, 1995) has been one of the more persistent critics of naturalized epistemology. Three of his arguments deserve closer attention. He has recently remarked that traditional epistemologists seek some perspective outside of science from which science can be evaluated. Because he thinks that we can transcend our current total scientific theory without transcending our entire conceptual scheme, then we can work within the latter to ask questions about the justification of the former. However, attractive as the distinction might be, there is a strong objection to Seigel's view. Our observation statements are

the empirical anchors of science and our total conceptual scheme. It makes no sense to say that our conceptual scheme remains adrift from our basic scientific sentences. Further, our empirical evidence is distributed across the entire conceptual network so the postulated distinction between science and the entire conceptual scheme becomes blurred. Since science permeates the whole of our conceptual structure it is difficult to see how Seigel's claim to stand outside of science can get much of a grip. On a different tack, Seigel (1995, 52) thinks that the naturalist epistemologist misconstrues traditional epistemology by claiming that the latter seeks epistemic standards which are firmer than science. He suggests that the epistemic foundation can be less firm and more tenuous than that which it justifies. But it does seem an odd position to advance since typically we search for a solid base upon which to construct a superstructure, be it in architecture or epistemology. We normally want our inferences to go from the more to the less firm; to hold to the opposite runs contrary to the most fundamental principle of traditional epistemology. Finally, Seigel thinks that science's appeal to science to justify the standards of science begs the question because it presupposes the very naturalism it seeks to establish. Two responses can be made to this. First, if observation statements are our entry wedge to the world, then they come prior to any more highly theoretical claims about their truth. Second, how is it possible to establish the norms of science prior to science itself? When science has made some progress then the standards of science can be generated out of scientific practice, and revised in the light of continuing practice. How they can be established prior to science remains unclear. As Brown (1988, 55) asks, "What cognitive resources do we human beings have that allow us to grasp norms a priori?" If we appeal to the idea that a priori truths are analytic truths then it follows that a priori norms are analytic truths, and it is then a further question of how we can use analytic truths to justify epistemic norms. As human beings, it would seem that the only way of grasping truths about the world is by way of our interacting with the world, and these truths are, to the last, revisable as a consequence of what we learn about the world. Brown (1988, 69) continues:

Norms, in the forms of both ends for science and methodological imperatives, are introduced and evaluated in the same manner as theoretical hypotheses, experimental designs...and other features of the so-called content of science. People propose them and try them out. If a proposal looks promising it is pursued, and if its promise vanishes it is modified or dropped. Aspects of highly successful theories - as judged against currently accepted criteria - may be taken as norms for further research in that field. An approach is judged to be successful in one domain, workers in other domains may attempt to model their own research on it, and so forth....The norms are proposed and evaluated in the normal course of doing science.

In short, as science progresses, cases emerge where new theoretical principles come to the fore and are adopted as norms. Likewise, there are other instances where existing norms are revised or rejected.

So, (1) naturalized epistemology does not attempt to deduce norms

directly from facts because values are not deducible from facts. Norms are hypotheses generated from practice; (2) there is no circularity in using science to justify science because the rules of science evolve out of science and are diverse just as the activities of science are varied. The norms are as revisable as the rest of our conceptual scheme so cannot be a priori; (3) there can be no final, absolute justification of science anymore than there can be such a justification for any other human activity. There seems to be no plausible candidate for first philosophy which could provide an a priori justification of science. The justification of science is no more and no less secure than science itself. Certainly there is a strong normative strand to normative epistemology - in revising theories, or in adjudicating between them, we can appeal to such norms as minimum disruption, conservatism, simplicity and the like. But there is a more fundamental consideration: Quinean naturalism does not just set out the causal story of knowledge acquisition and revision; rather, relating scientific theory to its empirical base of sensory experience carries with it the implying of true observation categorials by the theory formulation, and it is the observation categorial that spells out the inferential or justificatory relation between evidence and theory (Koppelberg, 1990, 208).

- 19 Quine, 1969a, 75-6. Quine's (1986, 664-5) expansion of this point is illuminative of the extent to which a naturalistic epistemology is able to draw off various branches of science in support of its claim:

Naturalization of epistemology does not jettison the normative and settle for the indiscriminate description of on-going procedures. For me, normative epistemology...is the technology of truth seeking....Like any technology, it makes free use of whatever scientific findings may suit its purpose. It draws upon mathematics in computing standard deviation and probable error....It draws upon experimental psychology in exposing perceptual illusion, and upon cognitive psychology in scouting wishful thinking. It draws upon neurology and physics, in a general way, in discounting testimony from occult or parapsychological sources.

Critics of naturalized epistemology frequently claim that since it deals with descriptive accounts of the acquisition of knowledge it cannot be normative. However, naturalistic epistemology gathers its normative force in several ways. Gibson (1988a, 47) suggests that if the only evidence we have for the external world is that of the stimulation of our sensory receptors, then we ought to limit our quest for evidence to such sources and not seek it in clairvoyance. This is a cardinal tenet of naturalism, that our information about the world is obtained through sensory stimulation. This is a normative point, an element of normative epistemology, favouring the empirical evidence of the senses over clairvoyance. Yet, in the spirit of the fallibility of science, clairvoyance is an option; although moribund it may one day take on a powerfully new explanatory role in which case science, at least of the naturalist kind, would wither away. If, as is extremely unlikely, clairvoyance should prove more robust than naturalized epistemology in accounting for what there is, then the normative epistemology would place a

greater weight on clairvoyance at the expense of science as we now practice it. In a similar vein, Brown (1988) notes that the norms which govern science arise out of the scientific enterprise and these have over the course of time been revised in the light of scientific correction. His key point is that the norms of science are themselves put forward in the spirit of science.

20 Gibson, 1982, 61. Quine's theory of language learning has been the target of an attack by Chomsky who questions the behaviourist tendencies. At the level of learning observation sentences, language is well enough learned behaviourally through social emulation and feedback. Here, language is directly linked to nonverbal stimuli where observation sentences are learned in an obvious stimulus response way. However, it is when we move from observation sentences to sentences of a more complex and theoretical nature not directly linked to nonverbal stimuli that an account of language learning becomes more problematic. Quine thinks that this more abstract learning is acquired by what he calls analogic synthesis - new sentences are learned by constructing them from already learned sentences, this being achieved by the learner using the method of analogy, of building new sentences according to the way the parts of the new have been seen to be used in the older sentences. The problem arises because the nonverbal stimuli are far removed from the verbal utterances and it is no longer clear what psychological mechanisms operate to enable the learner to arrive at new sentences from the old. The concept of analogic synthesis stands as a marker for processes largely unknown. Consequently, there is room for debate over the precise nature of the mechanism which permits the acquisition of language. The dispute between Quine and Chomsky centred on this causal aspect. For Quine, it is the linguistic behaviour of others which shapes a child's learning, and because the speech community adheres to a set of rules, albeit revisable, then the child conforms to customary linguistic usage. Chomsky, on the other hand, champions an innate mechanism responsible for language learning which is triggered by the linguistic behaviour of those in the speech community. Language has surface features (utterance) and a deep structure of universal grammar which goes largely unaffected by the acquisition of natural languages and the vagaries of the different speech communities. At bottom, the dispute between Quine and Chomsky comes down to this: "Quine rejects what he takes to be Chomsky's irreducibly mentalistic posits; and Chomsky rejects what he takes to be Quine's unreasonable, behaviouristic reductions." (Gibson, 1982, 180) In Quine's favour, it must be said that he does accept an innate mechanism - similarity standards - without which language learning could not get started, but this is far from being an innate language acquisition device. Further, since the universal grammar wired into this device is the repository of mental representations, then the question arises of the ontological status of such a device.

21 Romanos, 1983, 21-2.

22 Quine, 1960, 275.

23 Within naturalized epistemology, following the collapse of the Carnapian

distinction between the metaphysical framework of ontology and the empirical theories of science, both ontology and science have a pragmatic unity in the linguistic scheme. Empirical problems are now the province of both the philosopher and scientist with the consequence that while the scientist must become more philosophically literate, "the philosopher now has the added *responsibility* of learning some science" (Gibson, 1988a, 84). A good example of a philosopher doing just this is Churchland (1986).

Strawson's (1990) discussion of two conceptions of philosophy goes some way towards clarifying the dispute between scientific and ordinary language philosophers. For the scientific philosopher, philosophy is continuous with science although it is not the philosopher's business to tinker with scientific theory. Rather, scientific philosophy attends to our thought about the object of science, or better still to our language about these objects. Such inquiry, then, is semantic, epistemological and ontological, and is decidedly extensional - objects and classes satisfy the requirements of precision and clarity in a way that intensional entities (eg. propositions, meanings) do not. Ordinary language, on the other hand, admits a more liberal ontology, and may go so far as to include propositions and meanings, as well as minds and mental states. Is there really a way of adjudicating between these two accounts of philosophy, between the austerity of scientific philosophy and the richness of the ordinary language approach? Strawson (1990, 318) thinks not:

...the choice between them is ultimately, perhaps, a matter of individual temperament, and if I have made my preference clear, it is no more than that - my personal preference. It has been said that the best conceptual scheme, the best system of ideas is the one that gets us around the best. The question is: in what milieu? For one content to lead his life - at least his intellectual life - in the rarified atmosphere of science, the choice, on this test will go one way. For one content to lead his intellectual life in the muddier atmosphere of the more mundane...it will go the other way.

Two observations are warranted. Being a scientific philosopher does not restrict philosophy to the scientific domain. What it means is that a scientific attitude is applied to the philosophical task. And if the mundane excludes science then so much the worse for ordinary language philosophy.

- 24 What is being rejected is the restriction of philosophy, and philosophy of education, to the method of conceptual analysis - that is, the elucidation of the necessary and sufficient conditions for the use of a concept. There may still be a role for analysing concepts within a theory, but this would be only a small part of doing philosophy.
- 25 Langford, 1968,30.
- 26 Churchland, 1986.
- 27 Barrett & Gibson, 1990; Davidson & Hintikka, 1969; Hahn & Schilpp, 1986;

Inquiry, 1994; Quine, 1969b, 1986, 1990, 1994.

28 Quine, 1990a, 1990b, 1993, 1994.

29 The range of Quine's philosophical work is, as befits a philosophical system, rather broad, ranging from logic and mathematics at one end to values at the other. Not all of what he has had to say is immediately relevant to the task at hand, so nothing is said here about such matters as: indeterminacy of translation, inscrutability of reference, ontological relativity, modal logic and mathematics. But this still leaves much of importance, so Quinean naturalism and naturalized epistemology, language learning, semantics of science, underdetermination of theory and holism, extensionality and canonical notation, and his views on ethics are all drawn upon with varying degrees of endorsement.

In the early chapters of this account of a naturalized philosophy, because the discussion is largely sympathetic to the Quinean position, the case for a naturalized philosophy, especially its epistemological and materialist components, is presented in such a way whereby the criticism raised against his claims (and the counter-arguments) are relegated to the background, being contained in footnotes. So too with the ontological, where objections to eliminative materialism in particular are similarly dealt with. However, on matters axiological, where the naturalizing of values requires a detailed working out of largely uncharted waters, then criticism is brought to the fore by incorporation into the text. Clearly, not all of the objections raised by critics of naturalized epistemology and eliminative materialism can be dealt with. However, an attempt is made to consider some of the more significant lines of criticism as well as setting down some counter-arguments. The aim is not to engage in a full-blown analysis of the philosophical disputes but rather to point to some of the more significant arguments raised and how these might be dealt with.

CHAPTER SEVEN

OUR THEORY OF THE WORLD: ONTOLOGICAL AND EPISTEMOLOGICAL CONSIDERATIONS

Human beings, like all other animals, are problem solvers. Their first, and most pressing, problem is one of survival itself; how to reproduce in kind to avoid the fate of those whose future has been sealed by their inability to solve this most fundamental of nature's predicaments. For those endowed with the capacity to rise above a potential material demise, continued existence carries forward their history of accumulated experience. Yet none, apart from humans, appear to be able to so systematically tackle the problem of making sense of their own involvement in the world, to coherently talk about their immediate sensory experience in such a comprehensive manner. How is such an achievement possible? Few accounts offer a more explanatory solution to the problem than that proposed by Quine whose systematic response to the question of how we acquire our theory of the world stands as a celebrated milestone in the philosophical quest for a plausible elucidation of what there is.

Three key claims underpin the view of naturalism that is to be developed here: the world consists of physical entities alone, the evidence for what is real comes by way of our senses which are themselves part of that world, and the only reliable theory of the world is the physical explanation of scientific theory. These claims will duly be made good.

Ontology and epistemology are best understood through the notion of 'reciprocal containment'. Ontology (science) is about what there is and attends to truth while epistemology targets how we know what there is, being a matter of method and evidence. It is ontology which tells us of what the world consists; epistemology, on the other hand, is here held to be not a theory of truth but a theory of corroboration (or warranted assertion), of the evidence to support our affirmations of what there is. Ontology and epistemology are interconnected via their reciprocal containment:¹

epistemology is contained in ontology - as naturalized empirical social science it is a branch of science; ontology is contained in epistemology for it is epistemology that provides the evidential support for ontology, including empirical social science itself.² That epistemology is contained in ontology is evinced in three ways. First, epistemology assumes the existence of the real world, that there are things having existence independent of our talk about them. To hold otherwise is to slide into idealism, the doctrine that thought is the only reality and that external objects consist merely of ideas. Rejection of an epistemic foundation firmer than our knowledge of the world, while retaining the reality of the world, permits the use of whatever scientific knowledge or evidence there is available to defend a realist account of the world.³ Second, epistemology is concerned with evidence, and the evidence is sensory evidence: "Whatever evidence there *is* for science *is* sensory evidence."⁴ Our evidence for the external world comes by way of our senses: "science itself teaches that...the only information that can reach our sensory surfaces from external objects must be limited to two dimensional optical projections and various impacts of airwaves on the eardrums and some gaseous reactions in the nasal passages and a few kindred odds and ends."⁵ Thirdly, epistemology's contact with the world is by way of the activation of sensory receptors (nerve endings, retina, etc) by physical objects. Since such contact is physiological, epistemology presupposes an ontology of both sensory receptors and external objects.

Likewise, ontology is contained in epistemology. The ontology of science is projected from sensory stimulation but is established within the theory of evidence. It is from our sensory stimulations that we theorize about what there is which will account for our stimulations - it is from within our theories that we posit what there is, but which of our ontological commitments are real is determined by our empirical evidence.

Given reciprocal containment, ontology informs us whether our theory is true and epistemology provides us with evidence for our ontology. However, since both claims are themselves constitutive of our more global theory, our theory of the world, they too are fallible - in the spirit of science it is possible (although unlikely) that our evidence for what there is will reach us by nonsensory means.

A difference is to be noted between reception and perception. At the level of

reception our sensory receptors are stimulated variously. Reception is a continuous physical state of nerve arousal, occurring whether we are awake or asleep, and whether we are conscious of it or not. The sensory receptors, nerve endings and all, are the entry point of unrefined data about the world. While being the sole avenue of contact with what is real, these mechanisms afford no more than direct sensory stimulation of a neural sort. Reception is a characteristic of all living creatures. But not so with perception which is the good fortune of only a few. It is only when the information acquired via the senses becomes processed through conceptualization and vocabulary that it becomes systematically meaningful at the level of observation. The capacity to respond in myriad ways, including those of a linguistic sort, to sensory stimulation lies in our having acquired the language of our particular community, making revision here and there as we go. These, the utterings of ourselves and others, are physical irritations of our senses to which we have learned to attribute meaning. Perception, while physical, is nonetheless theory-laden.

Our sensory receptors are disturbed in their various ways - we respond verbally and otherwise: "Light rays strike my retinas; molecules bombard my eardrums and fingertips. I strike back, emanating concentric air waves. These waves take the form of a torrent of discourse about tables, people, molecules, light rays, air waves, prime numbers, infinite classes, joy and sorrow, good and evil."⁶ How is it possible for such meagre input to result in such prolific output? Put simply, from the physical stimulation of our sensory receptors we have projected an overarching theory of what there is to explain and predict our experience. The central epistemological problem, then, is this: given the evidence of our senses, how do we attain our global theory of the world?

To explain the irritations of our senses - the disturbances of the retina, the activation of the taste buds, the vibration of the eardrum, the tingling of surface nerve ends and the stimulation of the olfactory neurons⁷ - requires the elaboration of a linguistic framework or conceptual scheme to talk not only of the irritations themselves but also of their antecedent causes and posterior effects. The irritations of our senses are all we have to go on - thus we begin to posit entities, objects first and foremost but not solely, to account for our sensorial perturbations. Such posits, our ontology, are what our theories say there are:

To call a posit a posit is not to patronize it. A posit can be unavoidable except at the cost of other no less artificial expedients. Everything to which we concede existence is a posit from the standpoint of a description of the theory-building process, and simultaneously real from the standpoint of the theory that is being built. Nor let us look down on the standpoint of the theory as make-believe; for we can never do better than occupy the standpoint of some theory or other, the best we can muster at the time.⁸

All that our theories posit are posited as convenient intermediaries which owe their place to their efficacy as devices for "working a manageable structure into the flux of experience".⁹

Although in a sense a theory is an idea or set of ideas, the only way of getting at the theory is by way of the words that express the idea, and this means the sentences employed to state the theory.¹⁰ Likewise, our observations, being the stimulations of our senses at the perceptory level, are private. Observations are crucial to the whole linguistic enterprise, but by their very nature are subjective. Instead of observations we can do no better than turn to observation sentences which report our observations, for observation sentences are out in the open where public agreement can be secured.¹¹ Observations are theory laden and vary with the observer's prior theoretical learnings and present interests; however, the subjective variance of observation can be arrested by the intersubjectivity of observation sentences to which all observers present can proffer their assent or dissent. There is nothing to be gained, then, by limiting our attention to ideas or observations. Both are idiosyncratic, restricted to the person who does the thinking or observing. Only when they are expressed in words can they be assessed. Language transcends ideas and observations to offer intersubjective immediacy of agreement; we can study words more clearly than ideas and observations by attending to what others say they thought or observed. The power of language, by virtue of its social character, lies in the great measure of concordance it affords: various sensory experiences may be taken as one and the same sensation due to the similarity of each and the next yet slippage from first to last may occur. Language, or more precisely a linguistic community's word or term for the sensation, will check the drift by

setting a standard of intersubjective referential agreement. By the same token, language is firmly fixed to sensory experience via observation sentences.¹² Language, being a socially acquired assortment of dispositions to respond to verbal and nonverbal stimuli, offers a high degree of uniformity across the linguistic community which is characterized by fluency of dialogue among its members to varying degrees of generality or speciality. While few, if any, speakers acquire their vocabulary in exactly the same way we are nonetheless sufficiently agreed in the use of our words to maintain more than adequate communication, especially where observation sentences are concerned since there will be little variation in their stimuli. An observation sentence simply passes over previous experience of members of a speech community to secure agreement. Not so, however, with sentences which are connected to other sentences and ultimately are indirectly linked to remote experience - here there is considerable room for disagreement.

Our interest, however, lies in the cognitive meaning of the class of declarative sentences used for making assertions for these are the very stuff from which our global theory of the world is made. Such sentences are either true or false. Cognitive meaning hinges on truth; to grasp the cognitive meaning of a sentence is to apprehend the conditions under which the sentence is true or false. In the global network of sentences four graded categories of sentences are discernible - occasion, observation, standing and eternal sentences.¹³

An occasion sentence is one that elicits either assent or dissent (or abstention) on each occasion it is queried when some prompting (usually nonverbal) stimulus is present ("That is the mayor's car"). It has no truth value apart from the occasion. A subclass of occasion sentences is that of observation sentences which are intersubjectively affirmed and generally prompt assent or dissent from any observer conversant with the language ("This apple is red"). An observation sentence will consistently elicit assent when the speaker's sensory receptors are activated in a particular way; when stimulated in other ways, dissent will obtain. Rarely on two occasions will an identical triggering of sensory receptors prevail, but the closer the match the likelier the assent.¹⁴ Now, all observation sentences are occasion sentences but not all occasion sentences are observational. Non-observation occasion sentences

may either require collateral information (as in the example above of the mayor's car) or lack intersubjective observability for all witnesses to assent to (A fisherman who asserts "I just felt a nibble" asserts an occasion sentence which is true or false depending on the circumstances of his utterance, but the circumstances are privy to the speaker rather than being open to public verification).¹⁵ Observation sentences, then, are those occasion sentences which command wide intersubjective public agreement by observers; they are the sentences which in everyday or scientific talk we can fall back on when pressed for evidence since they are firmly grounded in the broad linguistic community of fluent natural language speakers. They are sentences about ordinary, physical, everyday things - even in specialist linguistic communities employing technical language where the speakers use 'quasi' observation sentences at a level to satisfy colleagues ("There is copper in this solution"),¹⁶ they too can always be driven back to basic observation sentences of the wider linguistic community ("This liquid is green"). The significance of observation sentences is two-fold: they are basic to determining both the meaning and the truth of sentences. (1) For meaning, they are fundamental since observation sentences are the sentences we learn first, by reference to observational states of affairs co-existent with uttering assent or dissent. By such ostensive means do we learn the meaning of sentences. And although much of our language consists of interverbal transactions, at some point there must be reference to external objects for the inculcation of the meanings of words ultimately rests on sensory experience. It is this which marks out the contrast between observation and standing sentences. Observation sentences can be learned ostensively and often are, although they may also be acquired discursively, but in such cases they could still be mastered by ostension. Not so with standing sentences which are grasped only by their association with other linguistic entities. (2) For truth, observation sentences provide the evidential support for theoretical sentences. Observation sentences are generally more infallible (but not absolutely so) in a way that other sentences are not: observation sentences are learned through their direct association with the observable circumstances of their utterance, thus they are widely accepted as true except on such occasions as we may, for example, suspect the speaker of lying or perhaps having a poor command of the language or else we can offer some other explanation such as the influence of drugs or alcohol to account for the aberrant remark.¹⁷

Occasion sentences grade off into standing sentences in proportion to the lengthening of the times in which a queried sentence continues to elicit assent or dissent, with the eliciting coexistent with a nonverbal stimulation. Thus a standing sentence ("Copper conducts electricity") elicits assent or dissent without being prompted anew by some nonverbal stimulus (one need not connect copper wire to a bulb and battery). A subclass of standing sentences consists of eternal sentences whose truth values are more permanently fixed through time and from speaker to speaker. An eternal sentence may be either general (as with scientific laws or mathematical equations - eg $E=MC^2$) or specific when reports of particular events couched in vague terms (using indicator words such as 'his', 'this' and 'here') are rephrased to incorporate additional information marked out by names, dates and locations.¹⁸ Eternal sentences are like occasion sentences in one respect however; a person may be prompted by stimulation on one occasion to assent to an eternal sentence and on another to dissent from it. But where this happens, unlike the circumstances of affirming or denying occasion sentences, with eternal sentences it is the speaker who, in the light of new evidence, has, so to speak, changed his mind.¹⁹

The linkage between observation sentences and theoretical sentences is particularly tight: observation sentences are theory-laden insofar as their terms are also those of the theoretical sentences, their shared vocabulary providing the logical connection between them. Thus, observation sentences look both ways: they are observational because they connect to sensory stimulation and they are theoretical because they share the terms of the theoretical sentences. Further, observation sentences carry the burden of empirical evidence for the truth of theoretical sentences even though this evidence is not distributed neatly across each theoretical sentence since theoretical sentences taken separately do not imply observation sentences, only reasonable conjunctions of theoretical sentences do.

Our sentences, taken together, stand not in isolation but combine, in their various ways, to form a global network or seamless web. At the periphery are the observation sentences linked to nonverbal stimuli, each having its own range of empirical content it can call its own. Progress beyond the limitations of observation sentences, to transcend the constraints of sensory experience, requires a linguistic

structure of sentences keyed to other sentences which are prompted by verbal stimulation. The emergent theoretical system consists of sentences, eternal sentences more toward the core, connected in manifold ways, the manner of which is not easily reconstructed since their acquisition by analagous learning is extremely diverse. The further from the periphery the less their nonverbal attachments; sentences at the core of the network retain their connections with other sentences to afford theories their particular character. Unlike those at the periphery, cued to nonverbal stimulations, the sentences ranged across the network are not each blessed with unique empirical content. Rather, "our statements about the external world face the tribunal of sense experience not individually but only as a corporate body."²⁰ The further a sentence is from the experiential periphery the less it possesses a "separate bundle of observable or testable consequences. Only a reasonably coherent bloc of sentences, taken as a whole, will have such consequences."²¹

As we have just seen, the linguistic network consists of descriptive (and, as will be argued later, evaluative) sentences; in addition there are normative epistemic (and normative ethical) principles whose significance lies in their guiding our decisions about which descriptive and evaluative sentences to accept or reject. Such principles lie at the core of the system and are some of the last to be surrendered. However, normative principles, both epistemic and ethical, are themselves not immune from revision but may be modified or abandoned in the light of experience. By recognizing such principles (including the principle of holism itself) as neither analytic nor deduced from definitions of the essence of science or humans, then the rules which govern science and morality are held mutable; within a naturalistic account the most venerate epistemic and ethical principles are not sacrosanct but through practice - scientific and/or moral - may also be revised or even abandoned.²²

The sentential network is thus a single system, tightly bound in places, loosely connected elsewhere, but none disconnected from the rest. Observation sentences are located at the outermost boundary while other parts of the system - logic, mathematics, theoretical physics - are far removed from the experiential edge: "The overall system, with all its parts, derives its aggregate empirical content from the edge; and the theoretical parts are good only as they contribute to the systematizing of that

content."²³ Since the empirical content at the periphery distributes itself across the theoretical network as a whole, no hard epistemic boundaries are to be drawn between different components of the system. The distinction, commonly made, between analytic and synthetic statements, that analytic statements (mathematics and logic) are true by virtue of their meaning (and therefore contain no empirical content which could influence their truth) while synthetic statements (empirical science) gather their truth from the empirical evidence, is misconceived. Far from logic and mathematics being untouched by the evidence of the senses, empirical evidence serves as evidence for the whole network including mathematics and logic. Although farthest from observation, these fields too are supported by and imbibe whatever meaning they might have, in the end, from the experiential boundary.

Since the component theoretical sentences of our global theory do not individually have empirical meaning, it is only a reasonably inclusive body of theory, taken as a whole, which will have observational consequences. Only a comprehensive theory can imply certain evidential effects, thus recalcitrant experience, or expected observations which fail to occur, do not indicate where and how revisions of the component sentences of the theory are to be made. Where a prediction, past or future, fails it is theory which is almost invariably declared false. The adverse verdict falsifies the conjunction of sentences - it points to one or more of the sentences being false, but not which since the prediction is not implied by any one particular theoretical sentence. Because the falsifying evidence impacts upon the network (but rarely reverberates across the network as a whole) to implicate both the theory under test and those auxiliary theories either connected to the tested theory or associated with the test procedures, then there is, *prima facie*, no saying which sentences may need to be revised. Readjustment of the theoretical network requires the redistribution of truth values over some of the statements which may entail revision of others logically connected to them. Since the aggregated theory being considered is so underdetermined by the empirical evidence there is considerable scope as to which statements will be amended as a result of accepting the evidence. No component of the system is immune from revision but equally some parts may be more readily given up than others; this point is well made by Quine in his claim that

any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system. Even a statement very close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws. Conversely, by the same token, no statement is immune to revision.²⁴

The force of such a thesis is two-fold. First, since no part of the network is safe from possible modification, then even the statements of mathematics and logic, lying at the core, are, in principle, revisable. Yet any revision will be guided by the principle of minimum disturbance of the whole; that which is amended will lie closer to the periphery than the core since the latter is so basic to our theoretical scheme. The sentences of logic and mathematics pervade the system and are the ones to be given up last, if at all; those sentences closer to the periphery receive greater attention.²⁵ Second, on occasions, and very few at that, revision of the network may extend downward to rejection of an observation sentence itself. However, only a well-founded and long-unchallenged theory could withstand a contrary observation. Where an observation yields to theory its waiving stands as an unexplained anomaly. While no theory can carry the weight of periodic waiving of recalcitrant experience, neither can a theory be abandoned in the face of conflicting evidence until an acceptable alternative is found. So, regardless of the few exceptions to the contrary, observation retains its primacy as "the tug that tows the ship of theory."²⁶

The difficulty of assigning empirical evidence sentence by sentence is underlined by the way mathematical and logical sentences mesh with those of the various sciences to jointly imply observation sentences. The limiting of empirical content to just a portion of the sentences is simply not possible. According to the holistic doctrine, each and every sentence of a non-fiction genre is vulnerable to revision or even repudiation, including those of logic and mathematics at the core of the linguistic network. In principle, these highly theoretical sentences could be abandoned, but in practice whether they are or not depends on the extent to which we are prepared to disrupt our conceptual scheme. Revision of logic and mathematics would reverberate right across the whole system; we would give these up last. The basic laws of physics

are slightly more vulnerable to amendment, while those elements further out toward the observational edge, including much of our social theory, are progressively more open to correction still. While the linguistic network is nowhere discontinuous, since logic and mathematics hold the edifice together, the various branches of inquiry which we have somewhat artificially differentiated are connected in their assorted ways. Those widely disparate (eg. chemistry and history) may be only very loosely linked, perhaps almost by mathematics and logic alone. Others, closely aligned (eg. sociology and psychology), will be more tightly bound by content. However, it almost goes without saying that our social theory must cohere with the theory of our more basic physical sciences. Thus, science is a continuous whole; no constituent parts, however disparate they may be, are disconnected from the rest since all parts share not only the laws of logic and mathematics but also our mundane generalities about the familiar bodies of everyday life.

The full force of holism is felt right across the theoretical network. No longer can the distinctions drawn between various classes of sentences be sustained; in particular, the sharp differentiation of analytic from synthetic statements and factual from evaluative statements begins to break down. The collapse of such dichotomies leads not to the conclusion that all sentences of the network have exactly the same properties; they do not. But neither are they logically distinct. Rather, they all have some essential features in common. It is this blurring, rather than complete elimination, of the differences which points to the close similarities which they possess by virtue of their membership of the conceptual framework.

The distinction drawn between analytic and synthetic sentences rests on the dubious assumption that some sentences - analytic sentences - are true purely by their meaning and independent of empirical support, while other sentences - synthetic sentences - are about the world and rely upon empirical evidence for their truth. Put simply, unlike synthetic sentences, those of an analytic kind, to be true, must lack empirical content.

The so-called analytic truths form an untidy set. There are the logical truths, being those sentences which owe their truth to their logical form. Shaped by the inclusion of the logical particles of language ('or', 'not', 'if', 'then', 'all', 'only', and so on),

such sentences remain true under any and all renderings of their substantive terms; variations of meaning do not entail their falsity. So, sentences of the kind "No unmarried man is married" retain their truth value regardless of how the component words ('man' and 'married') are defined. It is within the precision of logical notation, derived from the structure of logical sentences, that our languages - ordinary and formal - fall.²⁷

However, while logical truth is clearly defined, the class of analytic sentences held to be true by essential predication (synonymy) is not. While logical truth, once given a logical vocabulary, is marked off by a standard language of logical particles, the broader class of analytic sentences (as defined by their synonymy of meaning) contains no parallel to logically essential terms. Sentences of the kind "No bachelor is married" are held to be analytic on the ground that, by introducing synonyms for terms, such sentences can be reduced to logical truths of the kind "No unmarried man is married". Now, a word in a sentence is held to be synonymous with other words when the replacement of the former by the latter produces a cognitively equivalent sentence. However, whereas the relation between 'married' and 'unmarried' is one of logical opposites, that between 'bachelor' and 'unmarried' is decidedly conventional. The problem lies in determining whether the two words are synonymous - there simply is no logically exact means of establishing whether identity obtains since, unlike the substantive words of logical sentences, those of analytic sentences can vary their meaning and thereby alter the truth values of their encompassing sentences. As a consequence, there is no hope of saving analytic sentences by appealing to their transformation into logical truths. Now, while it is often concluded that analytic statements have a linguistic component only,²⁸ synthetic sentences on the other hand are taken to consist of two elements - one linguistic and the other empirical. Take the sentence "Oswald assassinated Kennedy": it would be false if the word 'assassinated' meant something else, such as 'fathered'; equally, it would be false if things had been different, if Kennedy had seen out his presidency and died in old age of natural causes. However, no succour is to be found in pursuing this bifurcating line of argument. First, no strict separation of sentences with empirical content from those without can be entertained since whatever empirical content there is available to support the linguistic network is holistically distributed across the system as a whole. The empirical content of

the observation sentences supports the theoretical structure as a whole with the theoretical sentences, to the last, jointly imbibing some empirical content, however remote such sentences might be from the experiential edge. There simply are no sentences devoid of empirical content, however meagre or tenuous this might be. Second, that feature attributed to analytic sentences but denied the synthetic, that the former are true come what may while the latter are revisable in the light of sensory experience, is too narrowly ascribed. There are times, albeit infrequent, when a synthetic sentence may be held come what may, if drastic enough revisions are made to the network. The immunity of a sentence from empirical correction is not limited to the so-called analytic sentences alone. Likewise, sentences taken to be analytic have, on occasions, lost this status in the light of empirical evidence.²⁹ There is, then, no hard and fast line to be drawn between analytic and synthetic sentences. Holism cuts across both analytic and synthetic sentences - many synthetic sentences can be held true come what may and many sentences judged analytic can be declared false when a body of theory is revised as a consequence of contrary indications. Thus, holism blurs the distinction since "the organizing role that was supposedly the role of analytic sentences is now seen as shared by sentences generally, and the empirical content that was supposedly peculiar to synthetic sentences is now seen as diffused through the system."³⁰

Scientific theories are underdetermined by the evidence, hence the possibility of constructing empirically equivalent rival theories to account for the data - the construction of theories and the differences between them can be taken to mark out the creative side of science.³¹ The doctrine of underdetermination of theory asserts that our theories transcend our observations, that our theories outrun the empirical evidence which can be mustered for them. Since our generalizations, however modest, cover more cases than any one utterer or all utterers could have occasion to experience, it follows that the grounding of science on observation sentences alone is a futile exercise. Our theories are underdetermined by past observations since a future observation could conflict with the theory. Equally, our theories are underdetermined by past and future observations because some conflicting evidence may go unobserved. Finally, scientific theory, in toto, is underdetermined by all possible

observation since much of our theory is non-observational: "What can be said about the hypothetical particles of physics is underdetermined by what can be said about sensible bodies, and what can be said about them is underdetermined by the stimulation of our senses."³² Given the underdetermination of theory by experience, how then to make the logical connection between the singular observation sentences at the experiential periphery of the linguistic network and the universal sentences of scientific theory at the core? Clearly, no direct linkage can be established, no simple derivation can be sought, since theory cannot be reduced to sheer observation alone. Rather, scientific language is the product of irreducible leaps of analogy, that is, most sentences a person acquires are constructed from components of other sentences previously learned, and are based on analogies with how these parts were used in earlier sentences. Because of the complexity of language development there can be no tracing back to establish the causal connections.³³

Aggregate science - mathematical, natural and social so called - is underdetermined by the data in the extreme, being most remote from sensory experience. Because theories transcend the available evidence to support them, different, competing theories can be developed to account for the observational data. Logically incompatible but empirically equivalent theories are thus possible since the observational evidence to hand does not settle the form which a theory must take, inasmuch as the same set of observation sentences could, in principle, provide the empirical support for the eternal sentences of an infinite number of different theories which we might have no way then and there of reconciling.³⁴ The distinction between ontology and epistemology now reasserts itself. Since empirical theory is the theory of what there is, the underdetermination of theory is the underdetermination of ontology because our theories go beyond the meagre empirical evidence we have for the theories; hence different systems of empirical and theoretical objects may be posited to account for past, present and future sensory stimulations. However, underdetermination of theory is an epistemological thesis since it is about evidence for theory, not about the truth of theory. It is meaningful to assert that competing theories are *equally warranted* by the same observational evidence because they all appeal to the same physicalist theory of evidence.³⁵ That is, they may be empirically equivalent

insofar as they all equally well account for the empirical evidence which supports them. But it makes no sense to claim that they are all *equally true* just because we are not all working from within the same theory of posited objects, and there is no external vantage point, outside of ontology, from which to survey rival, empirically equivalent ontologies. It is to confuse truth with evidence if all the ontologies are accepted as true.

It is a confusion to suppose that we can stand aloof and recognize all the alternative ontologies as true in their several ways, all the envisaged worlds as real. It is a confusion of truth with evidential support. Truth is immanent, and there is no higher. We must speak from a theory, albeit any of various.³⁶

We have no choice but to accept some theory of what there is which at that time settles for us what there is.³⁷ So, our interest in ontology is with what people say exists, with what they are prepared to attest as existing in the world. But existence is a notoriously slippery notion which needs to be dispensed with if we are to limn reality.³⁸ Establishing a person's ontological commitment through ordinary language is particularly difficult since ordinary language is rather inexact in what it references. What is required is a more precise, formal language which has as its primary task the careful elucidation of ontological commitment, of what our theories bind us to accepting as real. Such a language is canonical notation, so central to the scientific enterprise, and because of its technical nature, requiring some explanation.

Canonical notation sets the grammatical form and logical construction, but not the empirical content, of a scientific theory. It governs the way sentences may be paraphrased into the idiom of quantification; the objects and predicates of the theory, however, depend on how the sentences are paraphrased. The ontological commitment of an ordinary sentence is made explicit when paraphrased into the canonical notation of quantification since quantification permits generalized discourse about objects. The pronouns of ordinary talk are replaced by singular and plural terms;³⁹ plural and relative clauses admit quantification either by quantifier (all, some, none) or number. Once our ordinary talk is regimented sometimes artificially and perhaps awkwardly into the notation of quantification, then we can establish what things are assumed by the 'values of the variables' of the theory.⁴⁰

Canonical notation is not a system of logic for science alone but is a notation for all discourse, commonsense included. The regimentation of sentences into a canonical form permits both the translation or paraphrasing of ordinary talk into scientific theory, and theoretical deduction. To render a sentence of everyday discourse into logical symbols is to do no more than reduce it to the logical structure of ordinary language. Inferentially, where the goal is economy and clarity of expression, the simplest pattern of reasoning is canonical notation. When we examine the referential machinery of our everyday language we run up against various anomalies, contradictions and other irregularities such as ambiguity, lack of reference and imprecision. While these normally do not present serious difficulties in our daily discourse, they do give rise to substantial problems in philosophy and science where precision and clarity are required in order to establish ontological commitment. Since the vagaries of commonsense talk, when carried over into science, curb the scope of generalization, reduce the power of deductive relations of sentences and cloud referential affirmation, they must therefore be eliminated. This is done, not by seeking to construct an ideal language out of ordinary language nor by replacing our natural language with an entirely new formal language: rather, we must revise the only language we have, our natural language, using the resources already extant in the language to do so. Starting with the referential apparatus which we successfully employ in everyday talk, these are refined and extended by the judicious use of logic, so as to deal with the problematic elements of our referential talk. The underlying logical elements of ordinary talk are elicited and made precise by the application of modern logic: "The basic structure of the language of science has been isolated and schematized in a familiar form. It is the predicate calculus: the logic of quantification and truth functions".⁴¹ The virtue of notation is that it permits the framing of rules to classify theoretical implication and determine arguments as valid or invalid in the search for coherent theory. The grammatical structure of a strictly regimented scientific language is composed of four elements - variables, predicates, quantifiers and truth functions.⁴² By translating our ordinary talk into the idiom of predicate calculus, we gain generality of coverage, expedite the deductive connections among sentences and elucidate ontological commitment where, in its purest form, the regimentation of scientific language is structured by the logic of canonical notation.⁴³

Questions about existence connect with sentences, but not all sentences make the connection. Sentences starting with the universal quantifier 'all' have no existential import - "All men are mortal" merely states that for anything, if it is a man, then it is mortal. Thus, universal sentences do not establish the existence of their subject. Particular sentences, on the other hand, do.⁴⁴ Those beginning with the particular quantifier 'some' (or its variants) are existential - "Some children are sick" is equivalent to "Sick children exist", which is to say that sick children exist is the same as some things are sick children. But here the rot sets in, for linguistic similarity misleads us. An existential sentence of the sort "Sick children exist" appears analogous to "Sick children vomit". What confuses us is the predicate position of 'exist' paralleling that of 'vomit'. Their difference becomes apparent upon translation: "Sick children exist" is translated into the quantificational sentence "Some children are sick", whereby the term 'exist' drops out of the predicate position to be replaced by the quantifier. Not so with "Sick children vomit" - words like 'vomit' are genuine predicates which are translatable into other sentences only if their predicate position is preserved. In other words, an existence claim of the form "___ exists" is a covert quantificational claim of the type "Something is a ___". Existence, then is to be expressed in terms of quantification.

Quantification can be made more explicit through the austere precision of canonical notation which is an abstraction from the sentences of our scientific theory. The meanings of expressions in the formal language of canonical notation can be expressed thus: the explanation relates to the class of objects that form the subject matter of a particular expression. Names name the members of the class. For a one place predicate ('Fx') the extension or class of objects of which it is true can be identified. Thus, 'Fx' is true if and only if the object denoted by 'x' belongs to the extension of 'F'. By replacing names with variables ('x'), closed sentences are transformed into open sentences which say nothing until we determine what the variables stand for. With an open sentence ('Fx') a range of interpretations will result from assigning different objects to the variable. The open sentence may be true on some occasions of assignment and false on others. If the open sentence is true of all assignments of the variables it is a universal quantification; if it is true on at least one assignment it is an existential quantification.⁴⁵ Take a simple sentence, "John is sick." This is a singular

sentence, having as its subject a singular term ('John') which refers to a single individual (John). The subject of the sentence, 'John', is a name which can be linked to variables and variable-binding operations such as quantification. Quantification of the subject permits both the naming of the subject and ontological commitment to the object so named; thus, in "John is sick", 'John' stands as a name to which the canons of quantification apply. One such canon is that of 'existential generalization' whereby a name is replaced by a variable (such as 'x') to obtain "x is sick", the variable then being bound by the existential quantifier ('some', or in notational form ' $\exists x$ ') to reach the symbolic representation ' $(\exists x)(x \text{ is sick})$ ' (or, "For some x, x is sick") which in turn can take the schematic construction ' $(\exists x)(Fx)$ '.⁴⁶ It is by application of the existential quantifier ' $(\exists x)$ ' that a theory's ontological commitment can be revealed. What is taken to be, or what is real, is what is included as values of x. The sentences of the theory are first cast in the formalized pattern of truth functional connectives and quantification, and then examined to bare the existential quantifications. As Orenstein has remarked, "the logic of ' $(\exists x)$ ' is the logic of existence, and a notation that makes ' $(\exists x)$ ' explicit accordingly makes our assumptions - ontology explicit."⁴⁷ To revert to our example, when a predicate ("is sick") is genuinely assigned to a given individual ("John") the predication indicates that there is something to which the predicate refers. Accordingly, to say that ' $(\exists x)(x \text{ is sick})$ ' is to be committed to the existence of at least one concrete individual, in this case John. The upshot of all this is that names and variables are interchangeable - a variable is associated with a domain of entities, such entities being the range of values of the variable. Hence the adage "To be is to be the value of a variable" as the criterion of ontological commitment.⁴⁸

So, what is there? The question 'what is there?'⁴⁹ is, in one sense, easily enough answered by 'whatever there is'. But this is not a particularly illuminating account of the world. There may be nothing or there may be something, but whatever there is is not directly apparent to us. We do not begin with some atheoretical view of the world, a world consisting of physical objects, and then settle for a commitment to them. Rather, we start with our talk about the world and then determine what our conceptual scheme ontologically commits us to. Ontological commitment, our affirmation of what there is, begins with the meshing of instrumentalist and realist tendencies within naturalism.⁵⁰

On the instrumental side progress is made when we move from what there is to talk about things. Our conceptual scheme, projected from our sensory experience, posits various things to explain our past and present experience and to predict our future experience. What there is is what a given theory says there is since our imputation of reality can only be from within our theory of the world, albeit one of many. Ontological ascription outside of all theory is simply incoherent. We posit tables and chairs no less than molecules and electrons because they all contribute to making our conceptual scheme simpler and more unified than any alternative theoretical system we have so far been able to devise. All of our posits from the humdrum tables and chairs to the more exotic molecules and electrons and on to minds and mental states are theoretical entities which owe their continuing place in the linguistic and conceptual structure to their efficacy in accounting for our sensory experience. None are given to us by direct, unmediated acquaintance; all occupy the same status as hypothetical posits. A theory is committed, ontologically speaking, to all those entities which 'the bound variables of theory' refer. A person's ontology is what her global theory commits her to accept as real - the measure by which a theory admits a particular entity is this: to be true the theory requires the object in question to exist - it would be false if the thing does not.

However, the pull of instrumentalism must be countered by that of realism if idealism and relativism are to be avoided. Some posits are real, others not. There are, first and foremost, physical objects - four dimensional material content occupying space-time. Those macro-physical entities which have shape, substance and continuity, and can be demarcated from their immediate spatial-temporal milieu, we call bodies.⁵¹ Bodies are basic to our conceptual scheme; there is none more indispensable than the external things of everyday life - tables and chairs, sticks and stones. Such bodies are, ontologically, paradigmatic objects - they are the things which have been with us the longest, are fundamental to language as they are the referents of observation sentences and are the things learned about first, and they rarely give rise to disagreement between competent speakers of a language. Indeed, such objects are our touchstone with reality to which we turn in times of theoretical dispute. It is by reference to commonsense bodies then, that the very notion of reality is acquired.

Yet the familiar material objects are not all there is. Further removed are the

microscopic objects - molecules and their ilk, along with substances, processes, forces, and events are also admitted into our ontology. All of these enter into causal relations, with the acceptance of causal relations carrying our commitment to the entities posited. And then there are the abstract entities - numbers, classes, and classes of classes.⁵² These latter posits are more properly viewed as relations since, unlike the preceding categories, they have neither causes nor effects, are non-spatial, and have no role in causal processes. Yet we cannot do without them. Thus, macroscopic objects no less than the microscopic entities and abstract relations are posited to make experience, our sensory experience, more simple and controllable.

As our theories grow, so too do our ontologies grow as more entities are posited. To begin, bodies are posited, with other entities later appearing on the scene, thereby extending our ontology beyond bodies. Singular terms are taken as designating single objects; similarly, general terms are taken to designate a realm of objects - a class or set of properties. Ordinary language expands our ontology to invoke an array of novel things which are often poorly defined and where the ordinary person is vague in ontological commitment as to whether such entities are real or not. In other words, although reference is the relation of words to objects, just as singular terms are not necessarily denotive so too may general terms fail to refer. If our concern is ontological, to seek a strictly referential global theory of the world, how then to reduce this expanded universe to one severely limited to the lowest aggregate required to parsimoniously account for our experience?⁵³ By recognizing that it is science, not ordinary language, which more correctly depicts reality - it is to science rather than everyday talk that we must turn if our ontological commitment is to be vigorously probed. This is to deny neither that our ordinary language may be useful in a variety of social contexts as it facilitates communication, nor that it is dispensable to the task of regimenting the language into the extensional locution of canonical notation. Rather, it is to assert that our theory of reality is at its clearest, simplest and most economical when austere expressed in the scientific idiom.

Observation sentences have a particularly important role to play in the linguistic system; to gather evidential support for theoretical sentences and to provide linguistic sense since we learn the language by reference to the observations that give rise to it.

Two notions are central to this account: meaning and reference (or truth).⁵⁴ Each warrants explication. They must be kept apart since two words can have the same referent but differ in meaning - as with 'morning star' and 'evening star', 'human' and 'featherless biped'. Two expressions are synonyms when they have the same meaning - 'human' and 'rational animal' - and refer to the same objects. The *intension* of a term is its meaning for the user of the term. Meaning covers synonymy, definition and entailment while reference takes in naming, denotation and truth. Words, singular and general, refer to things. A singular term names an entity while a general term is true of one, some or all of a class of entities. The *extension* of a term is what the term ranges over: it is the class of all objects or physical entities picked out or referred to by the language. That which is denoted is whatever our theory posits. Sentences, of one word or more, are strings of phonemes or spaced letters, and only when taken in conjunction have meaning.

Meaning is forged in holism. Meaning inheres not in individual words or terms but in the whole sentences of theories. Sentences become the 'primary vehicle of meaning'⁵⁵ and the meaning of a sentence hangs, in a very general sense, on what counts as evidence for its truth. But this is no naive verification theory of meaning where each sentence has its own bundle of empirical evidence. It is a network theory of meaning.⁵⁶ Observation sentences do gather their meaning from their direct connection with objects; sentences like "Red ball" muster their meaning by reference to objects, in this case a red ball. They are learned ostensively and their meaning can be empirically checked, occasion by occasion, by the assent or dissent accorded them. Thus we learn our language, initially, by relating the sentences to the empirical experience that elicits them. Put simply, the meaning of observation sentences lies in the observations which are to count as evidence for and against them. But even here there is no simple one-to-one correspondence of meaning to immediate experience, for the sentence 'It is raining' may be keyed to our sense experience in various ways; by *seeing* the rain fall, *hearing* the rain on the roof, *feeling* the raindrops on the hand, or a combination of these. Theoretical sentences beyond the experiential periphery are learned partly by nonverbal association and partly by sentence-sentence interconnection. The meanings of eternal sentences, ones embedded nearer the core of the linguistic

network, are more indirectly elicited; because of their manifold linkages with other sentences and their oblique association with experience, nothing is gained by seeking the meanings of singular theoretical sentences. Only when taken conjointly as a body of sentences can they gather their composite meaning which gives any one constituent sentence its meaning. A consequence of holism is such that meaning may be allocated across theories in diverse ways; not every theoretical sentence has its own particular stand-alone meaning, nor does a sentence that appears in both an existing theory and a revised or rival theory necessarily have the same meaning since the correction of theories may lead to sweeping changes in the meaning of the constituent sentences. In the end, all sentences are meaningless unless they are theory bound and in some way empirically anchored.⁵⁷

It may be thought that a sentence, to be meaningful, must have something called a meaning to which it corresponds, and that this meaning is the same as or different from the meanings of other sentences. That is, the term 'meaning' is held to have some abstract entity to which it refers, namely, meanings.⁵⁸ Meanings, if granted, are taken to be a particular class of abstract entities - propositions. The meaning of a sentence is thus the proposition that it expresses. Propositions serve to indicate likeness of meaning between sentences; two sentences may have different phonemes or strings of letters but mean the same since they both express the same proposition. The problem of positing propositions, however, lies in determining when two sentences express the same proposition and when they do not. Since propositions are abstract entities the standard for settling their identicalness is remarkably elusive.⁵⁹ Because intensional objects are devoid of empirical content their identification is deceptive. As abstract entities they appear to serve no useful purpose beyond that of physical entities. Meanings and propositions, then, as obscure intermediary entities, can be discarded; rather, the meanings of sentences can be dealt with just as easily by speaking of semantic equivalence, letting the intermediaries go, for they offer no more than sentences might give. Instead of talk about grasping the meaning, giving the meaning or likeness of meaning, all mention of meaning in this sense can be dispensed with and replaced by talk of understanding a sentence, or equivalence of sentences.⁶⁰ Meanings, as abstract entities, simply fail to explain; we can do no better than recognize

that the meanings of sentences are implicit in people's speech dispositions to respond in behaviourally appropriate ways. Meanings are learned by behavioural criteria and are thus to be explained by behavioural (verbal) descriptions - by sentences, not propositions.

Sentences have meaning, or are meaningful, but their meaning is something external to them since the same sentence can have different meanings. Sentences gather whatever meaning they have from how they are used - there are no meanings beyond those implicit in people's dispositions to overt behaviour; meaning is therefore an index of a person's disposition to affirm or deny this or that sentence. Thus, while the meaning of a sentence is to be found in its use, sentences have meaning only within a body of sentences, not individually. Sentential meaning is stimulus meaning - it is the disposition to assent or dissent from a sentence in response to a stimulation, verbal or nonverbal.⁶¹ In the end, "all inculcation of meaning of words must rest ultimately on sensory experience."⁶² The theoretical sentences of the network only obtain their meaning by virtue of their links with other sentences, all of which are ultimately connected to the observation sentences whose empirical content is distributed across the system as a whole. The observational evidence for theoretical sentences thus stands as their empirical meaning.

If propositions can be dispensed with for meanings, they are still often posited as truth vehicles for sentences to overcome the difficulty of establishing the truth of different sentences which have the same meaning. The sentences may vary but the proposition which the sentences express remains steadfastly true, regardless of the circumstances of sentential expression. Once propositions are invoked then it is the proposition, rather than the sentence, which is held to be true or false. But to name a proposition expressed by some non-eternal sentence is to give the eternal sentence of the uttered sentence anyway, a sentence true or false independent of time, place and speaker; in which case, appeal to the eternal sentence as the truth vehicle can be made, letting the proposition go. The eternal sentence is related to the utterance of the non-eternal sentence thus; it is what the speaker could have uttered in the place of what was said without prejudice to what the utterance was about or for.⁶³

However, grant, for the moment, that there are propositions; what makes a

proposition true is that it states a fact. Facts arise in this way: sentences and propositions are likened to names with facts then posited for them to name. By admitting facts as things it is then assumed that it is facts that make propositions true. But facts, like propositions, are no more easily picked out. Fortunately, holism eliminates facts; because evidence is distributed across a body of sentences, there can be no one-to-one matching of a sentence and a corresponding fact - there can be no sentence-by-sentence check to ensure that each proposition mirrors a fact. Facts, as things, can go; and in ordinary usage the word 'fact' (as in "It is a fact that it is raining") can be replaced by 'true sentence' ('It is raining' is a true sentence) while still retaining the force of the original utterance. Here is the move from talk about things to talk about sentences. What makes a sentence true is not propositions or facts but the way the world is.⁶⁴

However, even if propositions are no longer required as truth vehicles, the matter of truth still remains unsettled. Earlier we saw how to regiment our scientific theories into the language of quantification and canonical notation to establish ontological commitment. We now need to clarify how truth values are to be distributed across these sentences. Preferably, it should be one in keeping with quantification and canonical notation. And there is such an account of truth, one which offers a scientific way of spelling out the truth conditions of sentences in both natural and formal languages - it is Tarski's theory of truth, which fits the process of quantification well.⁶⁵

If we begin with open sentences of the form "x is sick" we find that a range of entities are subsumed by the variable - the range of values of the variable (eg. John, Jane and any other named individual) satisfies the open sentence "x is sick". By regarding closed sentences with no free variables ("John is sick") as limiting cases of open sentences, the definition of truth is explicable. Three key terms - naming, predication and satisfaction - are central to the semantic relation between words and objects; names to the objects named, predicates to the objects they apply to, and open sentences to the realm of entities which satisfy them. The notion of truth is this: "a sentence is true precisely when the objects described in it are just as the sentence describes them. The key idea is that it is the things *in* the world, that is, the way the world is that makes a sentence true."⁶⁶ To use Tarski's example,

'Snow is white' is true if and only if snow is white

the sentence contained in the quotation marks names or refers to the sentence itself. 'Snow is white' names the sentence snow is white, and is the subject of the full sentence. The truth predicate 'is true' attaches to the subject on the condition of what the sentence 'Snow is white' says is so, namely, if and only if real snow is really white. The subject and predicate of the full sentence occur in different languages: 'Snow is white' is the object language which refers to the nonlinguistic object snow while *is true* is in the metalanguage where it predicates a linguistic object ('Snow is white').

Truth is a property of sentences. By two-valued logic we declare sentences to be either true or false and that it is the way the world is which determines truth. The truth of sentences turns on reality. We utter a sentence and say something about the world; to talk of the truth of a sentence is to go beyond the world, to speak about language. The semantic assent from the material mode of talk about things (snow) to the formal mode to talk about language ('snow') occurs because the truth predicate ('is true') has greatest force on such occasions as we are driven to talk of sentences. The force of the truth predicate is to remind us that while the named sentence is the subject, what is denoted is reality. That this is so is due to the cancellatory effect of the truth predicate upon the quoted sentence. In Tarski's paradigm sentence 'Snow is white' is true if and only if snow is white, the quotation marks permit talk about a sentence rather than about snow. The quotation, as the name of a sentence, contains a name ('snow') for snow. By virtue of calling the sentence true we say that snow is white. However, since the truth predicate ('is true') is a tool for disquotation, the sentence, unaided by quotation or truth predication, can simply be affirmed by its utterance (" 'Snow is white' is true" is to simply say that snow is white). The 'is true' predicate restores objective reference following semantic assent.⁶⁷

Tarski's semantic theory of truth thus reduces truth to other semantic terms in a formally precise manner. When applied to a formalized language such a definition of truth explains truth for each sentence in accordance with the semantic traits of the constituent body of sentences. With this formulation a relation of denotation (satisfaction) is first established between the open sentence of the language (snow is white) and the objects of the world (white snow). An important feature of Tarski's theory

of truth is that it can accommodate any ontology: what we take to be real can be named and spoken about within a Tarskian truth theory which appears to place no restrictions on ontology. Indeed, Ellis⁶⁸ and Romanos⁶⁹ concede that Tarski's truth theory may be correct in its account of what truth is insofar as sentences are bearers of truth and true sentences are true by virtue of their designating actual states of affairs. By eliminating correspondence between propositions and facts it becomes possible to speak of the relation between language and the world since the object language of the material mode can now be distinguished from the metalanguage used to talk about language. The truth of closed sentences (" 'Snow is white' is true") is a function of the satisfaction of open sentences from which they are formed - the term applies to all sentences obtained from the general formula

X is true if and only if p

by replacing 'X' with the name of any sentence of the object language and 'p' with the sentence itself.⁷⁰ "'Snow is white' is true if and only if snow is white" mentions only (1) an individual sentence, (2) truth itself, and (3) the objective circumstances under which the sentence is true. Now, ordinary language philosophers often point to the inability of the semantic theory to cope with natural languages which are deemed to be the basic languages upon which formal (scientific) languages depend; the supposed failure to explain the truth of natural language sentences is seen as a failure of the semantic theory to explain truth for all sentences. However, given that ordinary language itself builds upon the observation sentences of science, and formal languages are extensions of natural languages and substantially influence the development of the latter, then science can now be seen as the most systematically structured part encompassing natural language: Thus "the extent to which Tarski's methods are still inapplicable to remaining portions reflects the extent to which the task of reform has still to be completed."⁷¹ This points to the continuing need to replace our everyday understanding with the more formidable explanatory power of scientific theory. It is to this that we now turn.

NOTES

- 1 Quine, 1969a, 83. The notion of reciprocal containment, according to Gibson (1994, 451), is often misunderstood by some of Quine's critics. It is important, then, that any lingering confusion be dispelled, Ontology and epistemology are concerned with different things. Ontology deals with what there is; what there is is expressed in sentences which are either true or false, so ontology is linked to truth. Epistemology, on the other hand, is a matter of evidence, in Quine's case sensory evidence, which gives some warrant to our claim that a sentence is true. So, ontology tells us what there is and is a question of truth; epistemology tells us what evidence there is for what there is, and is a theory of evidence.

Although ontology and epistemology attend to different things they are, nonetheless, interrelated. Each contains the other, hence their relationship of reciprocal containment: "Ontology (physicalism) and epistemology (empiricism) 'reciprocally contain' one another. Thus, on the one hand, empiricism contains physicalism in the sense that whatever evidence there is for physicalism (or for science) is sensory evidence. On the other hand, physicalism contains empiricism in the sense that all epistemologizing takes place within a physicalist setting, replete with substances, bodies, physical objects (observable and unobservable), sets, and sets of sets, and so on" (Gibson, 1994, 450).

In Gibson's view, what leads many Quinean critics astray is their failure to appreciate the way epistemology is contained by ontology. If our ontology is a physicalist one, then epistemology must be pursued within a physicalist setting. Accordingly, epistemology presupposes that there is an external world of physical entities. If this was understood, there would be less room for rejecting naturalized epistemology.

- 2 Gibson (1986, 148-50; 1988a, 45-8). Although Quine (1969a) contains epistemology in science as a chapter of psychology, this characterization is rather restrictive in coverage. A more comprehensive account of containing epistemology within social science affords a wider range of competing theories to explain the acquisition of science; Flanagan (1982, 58) suggests such examples as cognitive psychology, critical social theory and neurophysiology - which is to take centre stage depends on which one of them best explains the projection of our theories beyond our sensory experience. Whichever theory wins out, it will, as Gibson (1982, 7) notes, be both mechanistic and physicalist.
- 3 To deny the reality of the external world is to deny the testimony of the senses, and to do so is to divorce the term 'reality' from those experiential occasions which give the term whatever meaning it might have for us. To deny that there is evidence of external objects is to cut adrift from any objective anchorage of linguistic usage, leaving us in a state of solipsistic splendour.
- 4 Quine, 1969a, 75.

- 5 Quine, 1973, 2.
- 6 Quine, 1966, 215.
- 7 Quine (1960, 31) limits visual stimulation, for example, to chromatic irradiation of the eye. He avoids what goes on beyond the retina, banishing examination of neural circuitry and the individual's formation of social habits. At the time, Quine was only after a person's socially acquired linguistic network which is amenable to public scrutiny. Given his behaviourist tendencies, such a stance is not surprising, but recent advances in neurophilosophy (Churchland, 1986) recognize no such limit in explanation. Quine (1990, 72) has recently recognized the significance of these developments. It should also be noted that the conceptual scheme does not arise directly from perception nor does it predate it. Rather, it is created in imaginative ways to account for our sensory experience.
- 8 Quine, 1960, 22.
- 9 Quine, 1964, 44.
- 10 A sentence is not to be confused with its utterance; it is a universal, repeatable sound or written pattern. A sentence can be uttered, and can be described as true, but to speak of a sentence as true is more extensive since it takes in those occasions when the sentence is not uttered.
- 11 Gibson, 1982, 34.
- 12 Quine, 1977, 177-9.
- 13 Gochet, 1986, 44-5.
- 14 Quine, 1981a, 25.
- 15 Quine, 1975a, 72-3.
- 16 However, while this sentence is evoked by a non-verbal stimuli, the efficacy of the stimuli itself depends on a prior learning of word - word association, in this case chemical theory.
- 17 Quine & Ullian, 1978, 51.
- 18 While physical laws favour no specific space-time domain, independent of spatio-temporal co-ordinates, such specificity is evident and welcome in social inquiry. Personal pronouns (I, we, you, she, he) are replaced by people's names; demonstrative pronouns (this, that) by the naming of referents, and so on for the various classes of pronouns. Tenses may be dropped, to be replaced by dates and times while 'here' and 'there' may be supplanted by specifying location (Quine, 1990, 78). The point of eliminating indicator words is two-fold. First, a measure of objectivity obtains, since truth becomes invariant over speakers and occasions. Second, deductive logic is enhanced. Now, clearly enough, in actual practice scientists of any hue will employ indicator words and use rough logic, but more formally presented, their work tends towards those standards of an idealized language in which sentences are invariant between speakers and

transparent in logical implication.

- 19 Note that the terms 'eternal' and 'permanently' are not to be taken as absolute. Standing sentences, like all sentences of the network, are revisable; but standing sentences, unlike occasion sentences, do have a certain measure of durability.
- 20 Quine, 1964, 41.
- 21 Quine, 1981a, 70. This means that an observation sentence lying at the periphery of the linguistic network ("This is a red ball") is directly linked to something empirical to which it refers. However, theoretical sentences lying at the core of the system do not individually refer to empirical entities. Such sentences are so far removed from empirical objects and are so general that their only connection with the empirical world is by two or more of them conjointly implying an observational categorical (whenever this, then that) which generalizes over particular situations which can be tested. This is explained further in chapter 8.
- 22 White, 1981, 91-3. The epistemological status of holism has been questioned by Seigel (1984) who suggests that the thesis enjoys an a priori, transcendental status. However, the notion of holism is itself part of the theoretical system and like the rest of the system it is an empirical claim, revisable if need be, about the practice and the language of science. The idea of holism did not predate science, rather it arose out of reflection on this practice.
- 23 Quine, 1966, 56.
- 24 Quine, 1964, 43. Objections have been raised against holism. Dummett (1981) is critical of the conjunction of holism with the revisability principle. He rejects the idea that an anomalous observation statement in conflict with accumulated experience can be saved by making adjustments somewhere in the theoretical system. However, it is difficult to see how holism can support a distinction between observation statements and the rest. Epistemologically, all components of our global system are on a par, for all statements are revisable, but some are more vulnerable to revision than others - those of science are more frequently amended than are mathematical statements. Further, observation sentences do have a measure of privilege not accorded the more theoretical statements since observation sentences are directly cued to nonverbal stimuli in a way that theoretical ones are not. But this is not enough to establish a difference in kind between observation sentences and the rest since there is little distinction between observation terms and theoretical terms: (1) since all objects are posited from within a theory, so are theoretical posits, words which refer to objects belong to a theory of enduring bodies, and (2) the same term can appear in both observation sentences and theoretical sentences - 'Water is drinkable' and 'Water is H₂O'.
- 25 Orenstein, 1977, 86.

- 26 Quine & Ullian, 1978, 29. However, as Flanagan (1988, 548) notes, observation sentences rarely provide true descriptions of the deeper structure of reality - the important scientific discoveries tend to be made "very far from mundane and direct observation."
- 27 The distinction between logical truths and the so-called analytic truths of synonymy is this: in logical truths the part played by the logical constants (is, nor, and, or, if, then, neither, some, all) is essential while the role of non-logical expressions is not. The basic particles operate in such a way that the sentence is true regardless of the content of the non-logical expressions (eg. "All__are__"). Sentences of the sort "All bachelors are unmarried men" are not strictly speaking logical truths; while they are formed by giving a synonym for a matching term in a logical sentence ("All bachelors are bachelors"), unlike logical truths they do not remain true for whatever expression we assign to the non-logical parts (Orenstein, 1977, 111-2).
- 28 Gibson, 1982, 97.
- 29 Hookway (1988, 41) offers an example from geometry of how a so-called analytic statement gradually lost its special status and came to be seen as false. There was a time, some two hundred years ago, when the claim that parallel straight lines perpendicular to a given line would never meet, would have been taken as analytically true. Such a view would never have been disputed. This century, in the light of developments in geometry and physics, it has become a genuine question whether such a claim is true. What was taken to be analytic prior to 1800 was rejected after 1900.
- 30 Quine, 1981a,71. Quine's rejection of the analytic - synthetic distinction has proved to be particularly controversial. For traditional epistemologists, the distinction provides for epistemic evaluation - the synthetic statements of empirical science are assessed against the norms formulated by analytic truths. Therefore, any collapse of the distinction would deprive us of a justification of these norms. It is this conclusion which naturalized epistemology denies.
- One of the earliest, and most influential, responses to the denial of the analytic-synthetic distinction came from Grice and Strawson (1956) who sought to defend the distinction. Their case rested on several related lines of argument. First, they addressed Quine's claim that because philosophers have failed to provide an adequate conception of the distinction there is no distinction to be made. Their reply makes it clear that even if philosophers have to date failed in the conceptual task this is not a sufficient ground for concluding there is no distinction to be made. As they put it, it is one thing to be able to apply the analytic-synthetic distinction, it is quite another to be able to provide a full definition of the terms. Indisputable as this may be, what we make of it is another matter. Grice and Strawson's argument trades on a tight notion of conceptual analysis, on the identification of necessary and sufficient conditions for the application of a concept. Their case would be compelling if this were the only account of the analysis of concepts available to us. But it is not. As Gochet

(1986, 21) remarks, if we adopt a theory of conceptual prototypes then the fact that we apply a distinction while being unable to define it does not entail that an actual distinction exists. On the prototype model no clear-cut distinction can be drawn between necessary and non-necessary features of a concept. Rather, those features held to be necessary are there only because they have a high probability of being a property of a concept in its many applications. Wittgenstein's (1953) games metaphor illustrates the point. The accepted definitions of a term are its default meanings built on the traits having highest probability, and have validity only as long as the instances of their application contain these traits. The addition of new information may necessitate the revision or elimination of features held by default. Accordingly, "if a statement classed as *analytically false* is, in fact, only a statement that is *typically false*, then it falls within the category of atypical statements or synthetic statements if an 'operator' such as 'sort of' is introduced" (Gochet, 1986, 23). For example, 'Jane is a female bachelor' and 'Jane is a sort of female bachelor'. The effect of this move is to recognize that while we may linguistically employ the terms 'analytic' and 'synthetic', the concepts they pick out are prototypical hence no clear definition is possible nor is there an actual distinction.

A second argument offered by Grice and Strawson (1956, 143) to justify the analytic-synthetic distinction rests on an appeal to actual philosophical usage:

In short, 'analytic' and 'synthetic' have a more or less established philosophical *use*; and this seems to suggest that it is absurd, even senseless, to say that there is no such distinction. For, in general, if a pair of contrasting expressions are habitually and generally used in application to the same cases...this is a sufficient condition for saying that there are kinds of cases to which the expressions apply; and nothing more is needed for them to mark a distinction.

Grice and Strawson assert that philosophical usage of the terms 'analytic' and 'synthetic' is a sufficient condition for concluding that such a distinction is real. However, there is nothing particularly absurd about the suggestion that a linguistic distinction may not pick out an actual distinction. Consider the contrasting terms 'witch' and 'nonwitch'. Although we may use these expressions to distinguish between women we take to be witches and those we don't, this does not establish the reality of witches and nonwitches. Likewise, although philosophers may employ the terms 'analytic' and 'synthetic' this, on its own, is insufficient to establish the existence of an actual distinction.

Grice and Strawson go on to offer what they take to be an even stronger objection to the attempt to collapse the analytic-synthetic distinction. Even if Quine is right that the philosopher's invention of technical vocabulary is dogged by philosophical mischaracterization, which they deny, they think that ordinary language confers validity on the analytic-synthetic distinction. Such expressions as 'means the same as' and 'does not mean the same as' also pick out the same distinction. Grice and Strawson conclude that a denial of this ordinary language distinction would have unfortunate consequences: it would not be possible to distinguish between meaning (intension) and reference (extension), nor would it be possible to say that sentences have meaning. Gibson (1988a, 91) offers a Quinean response to these two claims. First, the attack on analyticity is not an

attack on our common sense notions of the synonymy of meaning. The point is that while such ordinary expressions are used, they are ill-suited to the task of sustaining a notion of synonymy required for identity of meaning. Second, it is fallacious to think that it would be impossible to say sentences have meaning. They do, but what is rejected is the idea that for a sentence to have meaning there must be something called a meaning which it has, which is identical to or different from the meaning of another sentence. A third pitfall, not mentioned by Gibson, is this. The ordinary language expression 'means the same as' is itself in need of clarification no less than its more technical counterpart. Grice and Strawson take for granted that which is problematic, for it remains unresolved exactly what we mean when we say one expression 'means the same as' another expression. This was Quine's original criticism of analyticity, and it remains unanswered even by appeal to ordinary usage.

Another critic who has dismissed the naturalist attempt to collapse the analytic-synthetic distinction is Priest (1979), who claims that holism requires both content and structure. Content consists of beliefs and synthetic statements; structure consists of logical rules which are both analytic and foundational. But the distinction between beliefs and rules is a hard one to maintain. Priest's position is akin to Carnap's and is no more supportable. There seems to be no satisfactory way of quarantining rules from beliefs. After all, rules are a species of belief. If rules are justifiable only by their place in a holistic system then they too are open to revision along with the rest of the network. More recently, Quinton (1990) has returned to the question of whether the logical rules or truths are analytic. Whereas Grice and Strawson attempt to reconcile the analytic-synthetic distinction with holism - the absence of statements which are true come what may - and find it impossible to provide even one example of an unrevisable statement (which raises another question mark against analyticity), Quinton argues that at least one truth of logic, the law of non-contradiction, is analytic, on the ground that within holism the revision of components of a system presupposes contradiction between two or more components. Furthermore, Quinton questions whether the laws of logic, the laws of nature and observation reports are on a par. He thinks not, finding it unacceptable for the coherence of laws and nature and observation reports to be reached at the cost of revising logical laws. However, two points are in order. First, the mere fact that holistic revision contains noncontradiction does not make the logical law analytic. It remains part of the system but would be perhaps the most extreme case of where revision is to be made. Second, this said, Quinton is mistaken in thinking all three components of holism are on a par. They are not quite. Any revision of the system is far more likely to be made to the empirical laws, scientific theories and perhaps observation reports, leaving the laws of logic to last resort.

Hookway (1994, 474) summarizes the case against the analytic-synthetic distinction well enough: "it is to be understood as a denial that there are general principles or truths whose role is *distinctly normative*, providing rules to guide us in adjusting our opinions. We do not settle empirical or factual matters against the backdrop of a framework of analytic truths or logical principles which are not eligible for reassessment in order to make sense of experience." The so-called analytic statements are part and parcel of a holistic network subject to the same

constraints as are all other components of the system. Accordingly, there are no grounds for holding to a hard and fast distinction between two presumed classes of statement. There is but one such class, with some sentences close to the experiential periphery and more revisable while others remote from experience are amongst the last we would revise.

- 31 Gibson, 1988, 102.
- 32 Quine, 1966, 241.
- 33 Gibson, 1982, 56.
- 34 Quine, 1981a, 22.
- 35 The importance of empirical evidence for science is firmly established in the objective assessment of rival ontologies - this stands in marked contrast to the depreciation of evidence and emphasis on relativism associated with Kuhn and Feyerabend in particular.
- 36 Quine, 1981a, 21-2. However, Gibson (1986, 153) points out that Quine equivocates over the notion of two rival theories being true. At one point Quine (1981a, 29) argues for what he calls the sectarian position - one theory must be false, and in another essay in the same book (1981a), he takes an ecumenical stand - both theories can be true. More recently, in response to criticism, Quine (1986, 157) has announced that the sectarian position is his newly recovered stance.
- 37 Gochet (1986, 67) remarks that in attempting to elicit our ontological commitments we should not begin with questions formulated in the material mode, ie. 'What objects are there?' Rather, we have to frame our inquiries within a theory of objects and ask a semantic question 'What does a theory say there is?' Only after this has been addressed can we turn to the question of what theories should we accept? Finally, only within the answers to these two questions can the ontological question 'What is there?' be considered.
- 38 The term 'limn' is an architectural term meaning 'to describe in words'.
- 39 Personal pronouns (I, we, you, he, she) are replaced by people's names; demonstrative pronouns (this, that) by the naming of the referents, and so on for the various classes of pronouns. Tenses may be dropped, to be replaced by dates and times while 'here' and 'there' may be supplanted by specifying location.
- 40 The significance of the formula 'To be is to be the value of a variable' lies in the way the universe of entities is given full coverage by the range of values which fall within variables. Orenstein (1977, 36) demonstrates how the formula relates to other formulations of the same order. The following sentences are five ways of saying the same thing: 'There is such a thing as appendicitis'; 'the word 'appendicitis' designates'; 'The word 'appendicitis' is a name'; 'The word

'appendicitis' is a substitute for a variable'; 'The disease appendicitis is a value of a variable'. What this means in practice is clarified by Gibson (1982, 141-2).

If a true sentence of a particular theory of psychology, say, contained the expression 'mind' and if, when paraphrased into canonical notation, the sentence remained true if and only if we admitted minds as objects within the range of values of the bound variables of the new sentence, then and only then can we say: (a) the expression 'mind' is to be looked upon as a general term, (b) the theory of which the sentence is a part is committed to the existence of minds as objects, and (c) anyone maintaining the sentence as true would ipso facto be committed to the existence of minds as objects. It is in this sense that the canonical notation serves as a criterion for determining the ontological commitments of a theory; it serves as a means for making clear what a theory says there is.

41 Quine, 1977, 160.

42 Quantificational logic, or predicate calculus, is rooted in modern symbolic logic; it extends the power of syllogistic logic by laying bare the internal structure of the basic sentences and casting the subject-predicate construction in a calculus format. Take the sentence "Some cats are black". The key logical components are translated into calculus form thus - variables ('cats' or 'x'), predicates ('are black' or 'P'), quantifiers ('some' or 'all'), so that "Some cats are black" becomes "For some x, if x are cats, then x are black", or, in notational form, $(\exists x)(Px)$. The significance of predicate calculus and quantification lies in the deductive power which obtains between sentences of a scientific theory. The specific rules governing truth functions, or the allocation of truth values across compound sentences composed of simple sentences and logical connectives are best illustrated by reference to the truth table below.

Sentential Form | not A | A and B | A or B | If A then B | A if and only if B

A	B	$\sim A$	A & B	A \vee B	A B	A = B
T	T	F	T	T	T	T
T	F	F	F	T	F	F
F	T	T	F	T	T	F
F	F	T	F	F	T	T

By applying truth tables, derivations of logical connections between theoretical sentences can be assessed for their deductive power. Valid derivations include:

(1) modus ponens, or 'affirming the antecedent'.

If A, then B

$(A \supset B) A \rightarrow B$

A

 Therefore B

(2) modus tollens, or 'denying the consequent'

If A, then B $(A \supset B) \sim B \rightarrow \sim A$
 Not B _____
 Therefore, not A

Two forms of invalid deduction are

(3) 'affirming the consequent'

If A, then B $(A \supset B) B \rightarrow A$
 B _____
 Therefore B

(4) 'denying the antecedent'

If A, then B $(A \supset B) \sim A \rightarrow \sim B$
 Not A _____
 Therefore, not B

That (1) and (2) are valid deductions while (3) and (4) are not, can be demonstrated by substituting 'it rains' for A and 'the game will be cancelled' for B (Bechtel, 1988, 5-7). As any textbook on logic will show, far more complex notations than those above can be constructed which expose the logical relation between complicated sentence formations.

- 43 Gibson, 1982, 141. Because natural languages serve many purposes and are not particularly precise about what they are ontologically committed to, they are generally ill-suited to the task of parsing reality. For example, ordinary language contains expressions like 'unicorn' and 'witch' which do not refer, there being no such things as unicorns and witches to be denoted by these terms. So, the analysis of ordinary language will not provide a sufficiently precise accounting of what is ontologically real. To achieve this goal, natural language needs to be regimented into extensional semantics, employing the resources of logic, for as Harman (1986, 169) points out,

to do logic solely by analyzing ordinary language would be like doing physics by analyzing the opinions of the man in the street. It is only when natural language is regimented into a canonical notation suited to the construction of scientific theory that the ontological commitment, or what a theory is ontologically committed to, can be ascertained. Whereas natural language serves a social purpose of allowing us to get along with other people, and admits all and sundry into its ontology, a regimented language serves the particular functions of science, especially the determination of what the mind is. Hence the need to regiment natural language to requirements of canonical notation if the ontological commitments of natural language are to be settled.

- 44 The basic insight of there being a special relationship between the word 'exists' and 'some' was established by Brentano and further developed by Frege and Russell amongst others, into a full logic of quantification which has received its

most influential explication in the work of Quine.

45 Hookway, 1988, 85-8.

46 The most elementary form of sentence structure in science is represented by such symbolic expressions as 'Fx' where 'x' stands for a singular term denoting some object and 'F' stands for a general term. The reduction of indefinite singular terms proceeds as follows; 'each', 'some' and so on are reduced to 'some F' and 'every', 'all' and their ilk to 'every F' where 'F' stands for a general term. These two classes of indefinite singular terms are further reduced to 'something' and 'everything' followed by the phrase 'is an object x such that...'. These two formulations may be written in symbolic notation - '(\exists x)' reads 'something x is such that...' and '(\forall x)' as 'everything x is such that...'. The prefixes ' \exists x' and ' \forall x' are called the existential and universal quantifiers respectively. Accordingly, the sentence 'Fx' is true if and only if the object ('x') satisfies the predicate ('F'). Thus, in the sentence 'Rover is a dog', the word 'Rover' is the object ('x') and 'is a dog' is the predicate ('F'). Compound sentences are constructed out of such basic predications with the use of logical connectives (and, or, etc.) and quantifiers (each, all, etc.). To clarify canonical notation, the following conventions are followed:

(1) Truth function connectives - lower case letters (eg. 'p' and 'q') indicate sentence positions when linked with one or more of the symbolic connectives.

\supset	'if, then'	$p \supset q$	if p then q
&	'and'	$p \& q$	both p and q
\vee	'or'	$p \vee q$	either p or q
\equiv	'if and only if'	$p \equiv q$	p if and only if q
\sim	'it is not the case that'	$\sim p$	not p

(2) Quantifiers - 'all', 'some', 'none'.

(3) The subject of a sentence is represented by a lower case letter 'x' and the predicate of a sentence is represented by a capital letter 'F'. The predicate comes first followed by the subject - 'Fx'. Thus the sentence 'John is sick' is analyzed as

subject	predicate
'John'	'is sick'
'x'	'F'

or 'Fx'

When translated into quantificational form,

'John is sick'

becomes

'x is sick' or '(Fx)'

which in turn takes the symbolic form

'(\exists x)(x is sick)' or 'For some x, x is sick'

and the schematic form

' $(\exists x)(Fx)$ '

- 47 Orenstein, 1977, 33. This explication of Quinean quantification and canonical notation owes much to the clarity of Orenstein's (1977, 21-42) explanation of the topic. The determination of ontological commitment proceeds in two steps - the regimentation of language and then the application of a criterion of ontological commitment. To begin first with the regimentation of language. If we want to know what the world consists of, we need to know of a theory or an assertion exactly what it is ontologically committed to. It is reasonable to assume that a statement is committed to the existence of those things which are referred to by singular terms ; so we can suppose that the sentence 'The dog is black' is ontologically committed to the existence of at least one dog. Because ordinary language contains terms, or proper names ('unicorns') for objects we deny existence to (unicorns) then there needs to be a procedure for eliminating these names from our language if our goal is ontological existence. This requires the regimentation of language, natural and scientific alike, into logical form, in this case stilted English. Quine's example - 'Pegasus' - will help to clarify this translation. New terms can be introduced to express the property of being pegasus - the name 'Pegasus' can be rephrased as 'the pegasizer'. The regimented language takes the form

There is one and only one thing that pegasizes and has wings

It is not the case that something pegasizes

By ascertaining which sentences in this regimented form someone is prepared to assent to, we are well on the way to establishing a person's ontology because it permits the elimination of reference to non-existent objects in what we say.

Further progress towards ontological commitment is made when the sentences of scientific theory (and those of natural language suitably regimented) can be couched in a notation that permits the full range of sentences to be contained within a minimal set of logical expressions. In language, a distinction can be drawn between singular terms 'This book', on the one hand, and general terms 'is red' occupying a predicate position, on the other hand. Where the singular and the general are joined ('This book is red') an open sentence can be formed by using lower case letters (x) to represent singular terms and upper case letters (F) to stand for predicates or general terms. Now, the sentence 'This book is red' can be translated into an open sentence expressed by the canonical notation ' Fx '. From simple sentences complex sentences are constructed with the aid of connectives such as 'and', 'or' and 'if-then', which can then be expressed in strings of symbolic notation ($Fx \ \& \ Fx \ \& \ Fx \ \& \ Fx \dots$)

The open sentence ' Fx ' is interpreted as follows. It stands in relation to the class of objects that form the subject matter of the closed sentence which it represents. For the one-place predicate sentence ' Fx ' we identify its extension, that is, the class of the members of objects (or whatever) for which ' Fx ' is true. Thus, for a sentence of the form ' Fx ' we can explain its truth conditions by saying that it is true if, and only if, the object assigned to ' x ' belongs to the extension of ' F '. So, with the sentence 'This book is red' (or ' Fx '), it is true if and only if the object assigned to ' x ' (this book) belongs to the extension (or full coverage) of ' F ' (redness).

Canonical notation is easily enough achieved with one-place predicate sentences fulfilling the formula 'Fx'. But sentences of the form 'Something is F' and 'Everything is F' do not translate quite so readily, because 'something' and 'everything' are not singular terms. So, 'Something is F' would need to be expressed as a long disjunction 'Fx v Fx v Fx...' and 'Everything is F' would need to be expressed as a long conjunction 'Fx & Fx & Fx...'. There are two problems with this way of expressing disjunctive and conjunctive sentences in canonical notation. First, as Hookway (1988, 187) points out, there may be objects for which we have no name so they do not get included in the extended expressions. And second, because of the many objects to which the notation must refer, we are faced with an extremely long symbolic expression. The pragmatic way out of this difficulty is to assign logical expressions for 'Something is' and 'Everything is'. 'Something is' expresses what is called 'existential quantification' and is represented by the notation ' $\exists x$ '. 'Everything is' expresses 'universal quantification' and is represented by ' x '. To illustrate: the sentence 'Something is red' and 'Everything is red' are translated into stilted English

Something is such that it is F	$(\exists x)Fx$
Everything is such that is F	$(x)Fx$

Pronouns are introduced to replace proper names and these serve as variables since what falls under the pronoun 'x' will vary according to the closed sentence being considered at the time as a candidate for 'Fx'. So, the value of the variable ('x'), or the objects which are referred to by the variable 'x' will change according to the proper name picked out by the variable. Hookway (1988, 88) states the point clearly

For an open sentence like 'Fx' we can consider all the different interpretations that result from assigning to the pronoun or variable the different objects in the universe of discourse: the open sentence may turn out to be true on some of these assignments, false on others. Each assignment attaches a different 'value' to the pronoun or variable. Then, we can say that the existential quantification of this open sentence is true if the open sentence is true on at least one of these assignments; its universal quantification is true if it is true on all of them.

Accordingly, the existential quantification of the open sentence 'Fx' is true on some occasions of its being rendered 'This book is red' and false on others; the universal quantification of the sentence 'All books are red' is true if it is true on all occasions of its rendering. Quantifiers provide the key to establishing ontological commitment because the objects denoted are what count as cases when we say that something or everything is so.

The final step in determining ontological commitment lies in the force of the values of the variables, of what falls within the coverage of the pronoun. From this, Quine derives his formula for ontological existence; 'To be is to be the value of a variable'. Variables become the vehicle for reference, and for something 'to be', or to exist, it must be among those things denoted by the predicate - *this* book must be one of the things denoted by 'is red'. Or, as Orenstein (1977, 23) puts it, "to discover the existence assumptions, the ontological commitments, of a theory, we first state it in the language of truth functional connectives and quantification, and then look to the existential

quantifications we have made." So, to begin with, there are objects, bodies first and foremost, followed by classes, and classes of classes, and so on. For Quine (1964, 103) the criterion is always the same: "entities of a given sort are assumed by a theory if and only if some of them must be counted among the values of the variables in order that the statement affirmed in the theory is true." In this way are the sentences of science extensional for they include all those things which fall under a concept, these being instances of the concept.

48 Quine applies the semantic formula 'To be is to be the value of a variable' as the ontological standard: to take a simple example, if the variable of a theory (x) stands in place of 'table', then the reality of a specific table is it falling under the term 'table' or ' x '.

49 The notion 'exists' is a troubling one. Natural language sentences containing the word 'exists' (or its equivalent) can be restated in the idiom of canonical notation where the function of 'exists' is secured by the existential quantifier ($\exists x$). Orenstein (1990, 247) suggests that 'exists' has no place in a scientific theory when ($\exists x$) is available, since "Quine's quip that 'existence is what existential quantification expresses' is intended to sum up this view." The ontological question 'What exists?' can be rephrased as 'What is there?' The advantage of doing so is the elimination of excess philosophical baggage associated with 'exists' but not with 'is'.

50 On the instrumental side, Quine (1964, 44) remarks that
 as an empiricist I continue to think of the conceptual scheme of science as a tool, ultimately for predicting future experience in the light of past experience. Physical objects are conceptually imported into the situation as convenient intermediaries - not by definition in terms of experience but simply as irreducible posits comparable, epistemologically, to the gods of Homer.

But Quine is no instrumentalist, for on the realist side he notes:

For my part, qua lay physicist, I believe in physical objects and not in Homer's gods; and I consider it a scientific error to believe otherwise. But in point of epistemological footing the physical objects and the gods differ only in degree and not in kind.

The point to emerge is this. An instrumental approach is required to posit both physical objects and Homer's gods within a coherent epistemological network, but ontologically not all things posited are deemed to be real. There are physical objects but of Homer's gods there are probably none. Instrumentalism is severely constrained by realism. The only evidence we have for accepting that this or that thing is real is sensory evidence. But the connection is indirect; the sensory evidence for a sentence is insufficient to settle the reality of the referents of the sentence. Such evidence does, however, fix the empirical evidence for the truth or falsity of the sentence. Insofar as the sentence has some bearing on whether a particular thing is real or not, then the empirical evidence for the truth (or otherwise) of the sentence is taken as empirical evidence for the reality of things (Quine, 1969a, 11). So, our sensory evidence stands as empirical evidence for what is real. As Quine (1966, 238) elsewhere remarks,

Having noted that man has no evidence for the existence of bodies beyond the fact that their assumption helps him organize experience, we should have done well, instead of disclaiming evidence for the existence of bodies, to conclude: such, then, at bottom, is what evidence is, both for ordinary bodies and molecules.

The moral of the story is this: while we are limited by our sensory experience as to how we can begin, where our linguistic system may end is a matter of our creativity and ingenuity.

- 51 No two observers of a physical object observe it in exactly the same way since they occupy different positions of perspective. Nevertheless, we transcend the problem by using a shared language to reach agreement over reference. Further, we need to set standards for sameness of and difference between bodies; individuation of bodies - whether this object is the same one observed earlier or only like it - is settled theoretically within the linguistic network at the nonobservational level. Our acceptance of the continuing existence of bodies across time is underdetermined by our observation sentences, hence the reification of bodies to accommodate their enduring place in our theory of the world. So too have we reified other objects - liquids, gasses, and so on - taken as aggregated physical micro-objects.
- 52 The admission of abstract entities into our ontology to permit quantification over physical objects is tricky for naive physicalism. Hence the preference for the term 'materialism' rather than 'physicalism' so as to expand the range of inclusion, despite Quine's (1977, 191) view to the contrary that "to profess materialism...would seem grotesquely inappropriate, but physicalism, reasonably formulated, retains its vigour and vitality." Quine (1977, 186) draws a clear distinction between physical objects (there is no change in the physical world without a change in the positions or states of objects) and abstract objects (mathematics and logic) so as to exempt the latter from being in the world since such objects are changeless. However, the term 'materialism' might be a more appropriate term to use to range over both physical and abstract entities. As an example of classes and classes of classes, think of the class of cats, and animals as a class composed of the class of cats, the class of dogs and so on.
- 53 In Quine's (1964, 4) colourful expression, an "overpopulated universe is in many ways unlovely. It offends the aesthetic sense of us who have a taste for desert landscapes." Although the drift of his metaphor is clear enough, whether we would want to entertain an ontology almost devoid of content, as a barren desert implies, is questionable. Indeed, barrenness seems to be the sort of ontology Quine (1981a, 21) is after.
- 54 Meanings and propositions are intensional objects while sentences and truth are extensional objects (Orenstein, 1977, 49). The distinction between intensional and extensional entities is a philosophical differentiation of a technical kind. On the intensional side are those properties which go to make up a concept, as well as propositions, sentences, predicates and other linguistic expressions. The

extensional side includes all those things that fall under a concept, these being instances of the concept. So, while the concept of cat is intensional, the animals called cats are extensional (Gochet, 1986, 41). The distinction between the intensional and the extensional can be made clearer still.

An extensional sentence is one where the truth value of the sentence is unchanged when one component of the sentence is replaced by another. Given that the names 'Cicero' and 'Tulley' refer to the same person then the sentences

Cicero was an orator

Tulley was an orator

are extensional. An intensional sentence, of which a natural language such as English contains many, is one which is not truth functional. That is, the truth of the sentence does vary according to the simple sentence involved even when the simple sentence always has the same truth value. The sentences

It ought to be the case that the book is red

John believes the book is red

are intensional.

Extensional sentences are particularly suited to logical inferences, hence the importance of extensionality in science. A fully extensional science permits inferences to be made which can be tested. On the other hand, ordinary language sentences of an intensional sort are ill-suited to logical inference since their truth values change from one time to the next. To make intensional sentences extensional the familiar talk of mental states and the like must be dropped. Consider the sentences 'This book is red' and 'This book is the same colour as a London bus' and another pair of sentence 'John believes that his book is red' and 'John believes that his book is the same colour as a London bus'.

Suppose, as an example, that 'is red' and 'is the same colour as a London bus' have the same extensions. If our language is fully extensional there could not be two sentences which differed only in that one contained 'red' when the other contained 'is the same colour as a London bus', and which had different truth values, one being true and the other false. But it is easy to imagine such cases. If John does not know London, he may believe that his book is red while believing that his book is not the same colour as a London bus. Once again, we see that sentences built up using 'believes' are intensional (Hookway, 1988, 95).

Intensional sentences, especially those couched in the idiom of propositional attitudes, do not lend themselves to inference as required by science. We can let the propositional go and save the extensional sentence. The effect is to eliminate intensional expressions from scientific explanations at the same time as making the full resources of logical inference available for the development and revision of scientific theory.

There is no suggestion that we give up ordinary language, for it has proved entirely suitable in helping us navigate our world. However, once we search for a theory to identify what there is in the world we have little choice but to turn to the extensional logic of science to uncover our ontological commitment. A further virtue of extensionality is the support it gives to a concept of truth which intensionality cannot. It is hard to see what theory of truth could be applied to intensional sentences, for it is far from clear how intensional sentences are

capable of stating the way the world is.

- 55 Quine, 1969a, 72. To say that a sentence has meaning is to say no more than it is significant; it is not to assert that a sentence has some supposed entity called its meaning which stands behind it, as it were. Rather, sentences are human constructs, devoid of meaning except insofar as our connecting them to experience bestows meaningfulness upon them.
- 56 The term is Churchland's (1986, 267). It captures the theory of meaning defended here. The holistic theory of meaning rejects both the verification theory of meaning and operational definitions. According to the verification theory of meaning, the meaning of a theoretical or non-observational term is given by a set of empirical consequences of sentences containing the term and the term could thus be given an operational definition by spelling out the operation required to measure it. But the meanings of theoretical terms are given by the theories the terms are embedded in, not by the empirical consequences of the theory. This is because empirical consequences of theories are the consequences of whole theories, not just of individual sentences containing the expression. Additionally, to be taken into account is the background theory of the measuring or observational instrument being used. Even sentences which serve as operational definitions might be revised in order to accommodate new empirical evidence within the network. Although such terms as 'intelligence' and 'learning' do not have a richly developed embedding theory, it is nevertheless a mistake to think that operational definitions give them their meaning.
- 57 Putnam (1986, 409) objects to this account of meaning, asking how the meaning of a sentence can be directly tied to the conditions of its assertability, to the experience which confirms it. Putnam is mistaken if he takes this to mean that all sentences are directly tied to experience: the observation sentences are, for how else could our language gain a purchase on the world and be learned? But the theoretical sentences of the network are not directly tied to experience, but are only inferentially so.
- 58 Gibson, 1982, 31-2.
- 59 Quine, 1960, 200.
- 60 After all, when we ask for a meaning of a sentence we readily accept another sentence as its equivalent without asking for something that both share.
- 61 Gibson, 1982, 32. In the causal chain from things posited (eg. chairs) through the stimulation of our sensory receptors to neural processes to linguistic utterances ('This is a chair') where is the meaning of sentences, observation sentences in particular, to be located? Davidson (1990, 73) asserts that the point of meaning is to arrive at the sameness of meaning, whether this be the same sentence for different speakers or different sentences for the same speaker. But meaning can be grounded in at least two different sites in the

causal chain. According to the proximal theory, "sentences have the same meaning if they have the same stimulus meaning - if the same patterns of stimuli prompt assent and dissent" (Davidson, 1990, 73). This is Quine's position. On the other hand, the distal theory "depends primarily on shared causes which are salient for speaker and interpreter, learner and teacher. Meanings are shared when identical events, objects or situations cause or would cause assent or dissent" (Davidson, 1990, 73). This is Davidson's position. The distinction between these two theories is marked by opposing conceptions of meaning - the proximal theory, by focusing on sensory stimulations, makes evidence primary since sensory stimulations define stimulus meaning thus linking meaning to evidence; the distal theory, by stressing the realm of objects, makes truth primary by tying meaning to that which makes sentences intersubjectively true or false.

With its focus on the objects further out, so to speak, from sensory stimulation, the distal theory of meaning is able to dispense with sensory receptors, sensations, neural processes and the like. While these play a causal role, they have no epistemological significance. On the Davidsonian account, likeness of meaning is given by the stimulus of shared external objects, these being the relevant causal factors in generating meaning. While claiming that the distal theory of meaning is preferable to the proximal theory, Davidson does recognize a basic difficulty with his account - that 'the' common cause of utterances, located at a distance, may admit "too many candidates for the common cause" (Davidson, 1990, 77).

Davidson (1991, 193) rejects the proximal theory of meaning because it fails to adequately answer the question, what is the relation between sensation and belief that allows neural input to justify linguistic output? Since sensory stimulation plays a causal but not an epistemological role in meaning, they cannot be used to epistemologically justify observation sentences. Therefore, says Davidson, because nothing external is available to justify holding a sentence true, the only grounds for doing so is by appealing to some other sentence held to be true. If Davidson is right, it makes the proximal theory unintelligible. But is Davidson right? It would seem not.

The arguments in support of the proximal theory are several. First, intersubjectivity is to be found neither in the external causes as the distal theory claims, nor in neural stimulation as claimed by Davidson of the proximal theory. It is not to be found in sensations because there is no evidence to suppose that one person's sensory stimulations are similar to those of another person's stimulations when they utter the same sentence. Rather, intersubjectivity is located in our common language which arises out of neural inputs, whatever they might be (Quine, 1990c, 4). Second, while neural inputs may be causally connected to observation sentences, there is no reason to suppose that they are epistemologically related. Says Quine (1993, 110-111):

Some of my readers have wondered how expressions that are merely keyed to our neural intake, by conditioning or less direct ways, could be said to convey evidence about the world. This is the wrong picture. We are not aware of our neural intake, nor do we deduce anything from it. What we *have* learned to do is to assert or assent to some observation sentences in *reaction* to

certain ranges of neural intake. It is such sentences, then, thus elicited, that serve as experiential checkpoints for theories about the world.

This suggests that Davidson's objection misses the mark. Third, there is a problem with the distal theory which the proximal theory avoids. In the causal chain from object to utterance we can locate the stimulus anywhere along the continuum. Davidson locates stimulus meaning farther out at one end of the chain, in the realm of external causes. Others might seek to locate stimulus meaning farther in, in the realm of neural processes. Or stimulus meaning could be located somewhere in-between, such as the sensory receptors to which observation sentences are tied. The difficulty with locating stimulation of meaning at either end of the causal chain lies in the way neither permits singular identification. At the outer end, the subject matter does not, as Davidson acknowledges, always permit the homogeneity of subject matter. While cats and dogs might be neatly delineated, such is not the case with 'It is sunny' or 'It's hot'. At the inner end, as Dennett (1992) points out, there is no simultaneous synthesis of brain processes. Neural firings triggered by a sensory stimulation may take varying lengths of time to complete their processing because of the differing lengths of neural pathways to be travelled. One firing may be completed while another is not. This lack of neural homogeneity makes stimulus meaning impossible at any of the places in the brain. The advantage of locating stimulus meaning at the point of the sensory receptor is that the heterogeneity of inner and outer terminals of the causal chain are intersected by the homogeneity of the sensory receptors. Unlike the plethora of candidates for the common cause at either end, the senses are limited to a binary computation: stimulated or not stimulated. Such, then, are the reasons for retaining the proximal theory of stimulus meaning.

62 Quine, 1969a, 75.

63 Quine, 1960, 208.

64 Gibson, 1988, 113.

65 It should be noted that Tarski's definition of truth is extensional only; it belongs to the theory of reference and not to the theory of meaning. It clarifies the relationship between a sentence and its object by shedding light on what makes a true sentence true. It does not set out to establish what 'truth' means (Romanos, 1983, 138).

66 Orenstein, 1977, 43. This is a semantic variation of the correspondence theory of truth. It differs from the traditional formulation in this way - in the old view truth takes the form 'Snow is white' is true if and only if the proposition expressed by the sentence corresponds with the facts. The serious problems which have arisen over what is meant by 'proposition', 'correspond' and 'fact' are avoided in Tarski's codification. All we have is a means of referring to the sentence by naming it by quotation and the 'if and only if' truth functional connectives of canonical notation.

Gochet (1986, 46) has remarked in relation to Tarski's paradigm

sentence of truth

'Snow is white' is true if and only if snow is white

it is a necessary and a sufficient condition for the truth of the quoted sentence 'Snow is white' that snow is white. It follows, therefore, that it is neither necessary nor sufficient for there to be people to see that the snow is white for the sentence to be true. Truth is a matter of ontology, evidence being a matter of epistemology.

- 67 Quine, 1970, 10-2. The disquotational theory of truth is not without its critics. Quine makes it quite clear that truth is immanent rather than transcendental. By this he means that truth is internal to a theory rather than being external to and completely independent of our conceptual scheme. Truth is a property of sentences, and in the Tarskian formulation

'Snow is white' is true if and only if snow is white

truth can be made disquotational: to say that the sentence 'Snow is white' is true is to say simply that snow is white. The predicate 'is true' is attached to the sentence and the truth of the sentence can be established by dropping the predicate and affirming the sentence. The sentence 'Snow is white' can be affirmed with a 'Yes'. Bergstrom (1994) takes issue with the disquotational aspect. He suggests that the 'truth is immanent' thesis can be interpreted in two ways - (1) As an epistemological claim that, in the absence of a first philosophy which could provide an external viewpoint from which to justify truth claims, there is no alternative but to locate truth within our current best theories which happen to be the theories of science. Because truth is embedded within our total theoretical system it too, like the rest of the network, is revisable. (2) As an ontological claim that truth is in some way determined by our overall theoretical structure. In this case, truth becomes relative to what different people accept as competing accounts of the world. Bergstrom thinks Quine holds to (1) but not (2), but concludes that given naturalism it is hard to see how naturalism could imply an epistemic account of truth, since someone who accepts a naturalized epistemology is also likely to hold to objective truth insofar as truth is independent of our beliefs and utterances. And this, says Bergstrom, is exactly what Quine does accept - realism. Quine's (1994, 497) response to Bergstrom is instructive: "I am a realist about truth in whatever sense I am a realist about light rays and straightness." This position makes it clear enough that while truth is a property of sentences and sentences are elements of theories, so truth is immanent, what makes sentences true lies in the way the world is but our understanding of what there is is given us by our theories. So Bergstrom seems to have misinterpreted Quine's position. Bergstrom picks up a second point about truth, namely, that if truth is ascribed to a sentence then truth is disquotational. He takes this to imply that truth is not a property of sentences, so 'is true' is not an ordinary predicate. To demonstrate that truth is not a property of sentences, Bergstrom (1994, 424) proposes the following argument: "Suppose I say that the sentence 'Snow is white' is true. According to the disquotational account this simply means that snow is white. To ascribe truth to the sentence is to ascribe whiteness to snow. So I am talking about snow, not about the sentence. Since I am not even talking about the sentence, I am not ascribing any property to it." Here Bergstrom conflates a sentence with what the sentence is

about. Truth is ascribed to the sentence 'Snow is white' because snow is white. The talk might be about snow, and it is snow which makes the sentence true, but truth remains a property of sentences. It would be very odd to think of truth as a property of that which the sentence denotes. Finally, Bergstrom (1994, 433) asks, "if disquotation is all there is to truth, it is hard to see why truth is valuable or why truth is something that we want to pursue." But this worry can be dispelled. First, there is more to truth than disquotation alone. While on many occasions the 'is true' predicate can be dispensed with, on some occasions it cannot. There are times when specific sentences are not in a form conducive to disquotation, so the predicate is required, as in those cases, for example, when we want to say that everything that a person said was true. On these occasions truth must be ascribed to the sentences rather than simply stating them disquotationally (Quine, 1994, 347). Second, in science truth is not always what we pursue, not as an ultimate end anyway. In constructing our theories, making predictions, carrying out testing, and so on, truth may be no more than an instrument conducive to achieving other goals, such as our own and other people's well-being. Indeed, at times truth may not figure at all in the scientific enterprise. But when it does, only rarely is truth valued in any intrinsic way.

Nozick (1986, 359) asks whether the underdetermination of theory undercuts the disquotational notion of truth. If competing theories explain the data, and if the connection of these theories to the truth is unclear, then there may be no fact of the matter to assess which of the theories is true. For Nozick, this is a particular worry not so much at the level of specific theories but at the level of rival total systems. But it is clear enough that even here truth is immanent. We cannot stand outside of all systems and appeal to a transcendental standard of truth in order to adjudicate between them. Rather, even though we study other systems from within our own, truth is, as Tarski demonstrated, predicated only within a theory accepted at the time for it is to the sentences of a theory that 'is true' is predicated.

68 Ellis, 1990, 159.

69 Romanos, 1983, 171.

70 It should be noted that, as Quine (1970, 13) remarks, Tarski's truth formula in its familiar idiom

'Snow is white' is true if and only if snow is white

cannot be generalized to

'p' is true if and only if p

since 'p' is the name of the sixteenth letter of the alphabet which cannot be generalized over sentences.

71 Romanos, 1983, 154. Eternal sentences are the truth vehicles for theoretical discourse while in daily life what often counts as true or false are our utterances. For eternal sentences Tarski's theory of truth sits comfortably, but can be extended to everyday talk: "an utterance of 'I have a headache' is true if and only if the utterer has a headache while uttering it" (Quine, 1990, 82).

CHAPTER EIGHT

SCIENCE, NORMATIVE EPISTEMOLOGY AND THEORY

ASSESSMENT

The word 'science' has a variety of meanings, two of which will concern us, one narrow in its usage and the other not. The narrow sense of the word, and a contemporary one at that, refers to the systematic study of the nature of the physical world based on the observation, experimentation and measurement of the natural sciences. The limitation of such a notion is apparent in what is ruled out as science, namely, that which we have come to call the moral and social sciences. More broadly conceived, 'science', derived from the Latin word 'scientia' for knowledge, encompasses any body of knowledge organized in a systematic manner. The great virtue of retrieving the classical meaning lies in its scope - any body of knowledge arranged in such a manner as to exhibit a fair degree of internal coherence and a measure of evidential support for its component claims has reasonable grounds for calling itself scientific. The mark of a science, whatever the field of inquiry, lies in its systematicity or logical structure, for it is logic which binds the aggregate linguistic elements together, 'coupled with empirical adequacy.

Now, not everything that we know counts as science - much of our commonsense in particular - since it lacks the required integrating constructions necessary for systematization. But let it not be thought that, whereas science makes for system and commonsense does not, science is in some way markedly different from the epistemological status of our ordinary talk, for it is not. Insofar as our everyday utterances and those of erudite science have a common origin in our genetically endowed similarity standards and a shared ontological commitment to physical bodies as the empirical checkpoints of observation sentences coupled with their mutual application of the scientific method of hypothetico-deduction, broadly conceived, then there is much to commend the view that commonsense talk and that of science are of a kind, continuous and reciprocally dependent, even if science is more consistent than

our humdrum speech. The former sets store by the formulation of an ever expanding set of sentences, deductively implied, which avoid contradiction while the latter is guided more by the demands of practical communication. Not that our customary idiom is riven by contradictions - it is not. Only, in the conversational hustle and bustle of the market place such contradictions as arise, as arise they do, are all the more easily tolerated and even assuaged for pragmatic reasons of social intercourse that the rigorous canons of science preclude. Science may improve on ordinary talk in several ways; by paraphrasing to clarify what was said, explicating a vague term to make it more exact, or replacing an everyday expression with a more precise one. Science, then, is no more than a systematic attempt to extend the scope and depth of our modest commonsense understanding of ordinary physical bodies about us. To repudiate commonsense, to reject both the familiar things we say about objects in the world and the physical evidence for them, is to deny not only commonsense but also science itself. In short, science can never fully replace commonsense at the most basic level of observation statements; rather, at most it is a refined extension of what the person in the street holds true. So, in talk about ordinary objects, the difference between science and commonsense is one of degree rather than of kind.

The notion that there is a sharp line to be drawn between commonsense and science is a widely held but nonetheless mistaken one; there is a grading off but their continuity precludes their division. The defence of such a view takes us back to a point raised earlier: we are, as human beings, endowed with the genetic capacity to group like with like according to our subjective criteria of likeness. This innate similarity standard works from the earliest moments of a child's life in various ways - one adult is duly recognized as mother as other adults are not. With the acquisition of language, observation words are applied to familiar objects with increasing correctness; in turn, terms are employed to good effect to bring classes of objects under control. The idea that there is an external world, independent of language, is reached early on, and from childhood this is linguistically carried over into commonsense and science itself. Reference to external objects, so indispensable to the intersubjectivity required for a child's learning a language is no less warranted for the intersubjectivity demanded for testing the empirical claims of science. External objects are, ultimately, the arbitrating empirical checkpoints of both a child's language learning and a social researcher's

scientific theory.

The successful induction from like to like, from past experience to future expectation carries the child forward in her learning how to make her way in the world. Over time and with varied experience, our innate similarity standards are revised, little by little, as we modify our groupings and classifications.² As our grasp of the world becomes ever more extensive, and our inquiry progresses beyond commonsense, science no less relies on similarities of qualities which extend beyond but do not supercede those acquired by the great mass of language users. And it is obvious enough that, depending on our purposes, we employ that classification of similarity which at the time most adequately meets our needs, whatever these may be. Thus, there is a grading out of similarity from the innately primitive to the scientifically sophisticated with the latter differing only in degree of methodological complexity and theoretical clarity.

At the most rudimentary level of similarity, at the level of gross physical bodies and some way beyond, a child's learning is no more than a simple case of induction of future expectations (or predictions) come true; insofar as in induction there is no criterion of success bar the success of the induction itself, then the child in due course successfully arrives at a number of generalizations giving full coverage to those experiences which fall within its ambit and eventually more besides to include those which could be experienced but are not. At its fullest, the generalization ranges over all possible experience which could fall within it regardless of whether or not it is actually experienced by the utterer or any other person. It should be noted, however, that the success of induction on particular occasions is not an adequate justification for the principle of induction. Induction works on some occasions and not others, but induction from instances of successful induction does not warrant inductive certainty.

Not that there is anything particularly remarkable about similarity standards and induction - it is no more than learning from experience. We all do it, often rather well.³ Primitive inductive learning, grounded in innate learning standards, is indispensable to the acquisition of both commonsense and science. Indispensable because it serves as the entering wedge for the acquisition of observation sentences - we learn to apply the same observation sentence to similar situations and then receive confirmation from competent language users that our extrapolation from previous instances to future

cases is correct. Induction is the initial route for all human learning. That we are successful in our inductions, many of them anyway, is largely due to their survival value - they help us navigate our way in the world. Those about the world depend for their success on their having a measure of congruence with the world, and insofar as the world and our similarity standards fail to accord, albeit rather roughly, then our expectations will be dashed. On the other hand, our linguistic inductions, our getting right what we say about language on successive occasions, confirmed by another's affirmations, are less likely to fail since both speakers share similarity standards by virtue of a shared language. Social interaction goes a long way to achieving successful induction in social interaction.

Our inductions, then, or at least a good many of them, get us well on the way, but their success is nonetheless limited, strictly speaking, to no more than generalizing across our experience or, more broadly, across our experience and those similar instances not yet or never to be experienced. To suppose, however, that our inductions open up a window on the world by generating true generalizations is to have a misplaced faith in the efficacy of our innate similarity standards to match whatever similarities there are in the world. Those of the world are given by nature whereas ours are made, variable and subjective; yet, despite this, humans are remarkably successful in their inductions by having their expectations fulfilled. The explanation for this, if there is an explanation to be found, may well lie in our evolving brain and in our capacity, as a species, to learn from our mistakes by grasping that successful inductions should be adopted and failures avoided.⁴

Our innate similarity standards and inductions are fallible, but their indispensability to commonsense and to science cannot be denied, for the very simple reason that similarity and induction undergird observation. As commonsense and science advance their advancement depends on empirical checking for confirmation or otherwise of their predictions, and this presupposes that present and future observations, and more importantly observation sentences, are like those of the past. Only by appealing to innate similarity standards, revised by subsequent learning, can, say, an anthropologist's utterance "They are at prayer", made on several different occasions, be construed as referring to the same thing. So at the level of observation, and observation sentences, similarity and induction have a compelling claim to a

necessary place in inquiry.

Similarity standards provide for induction, and an improvement in similarity standards enhances success in induction; both are necessary for science, but not sufficient. If science consisted of no more than inductive empirical generalizations, then they would suffice, admirably so, but regrettably they do not since science is far more than induction, however perfect some of our inductions may be.

Science is a sprawling linguistic structure, composed of a network of conjectural sentences containing theoretical terms and through deduced hypotheses linked to observation sentences about observable things. The theoretical sentences of science are derived not directly from experience, as is the case with inductively derived generalizations, but by creatively devising an overarching superstructure of hypothetical descriptions and explanatory accounts which can accommodate our experience with a greater degree of coherence and profundity. While accommodating experience, science is no longer limited by the boundaries of experience but rather, its theoretical terminology far exceeds its evidential base. And so we have come to prize hypothetico-deduction as the framework for scientific inquiry - the devising, by our own free creation, of hypothetical theories from which are deduced by logical means observational tests of the theory. In a narrow sense of the term, 'hypothetico-deduction' picks out a particular methodological approach to inquiry which sets out a logical deduction from theory to observation. Thus, researchers start with a particular theory, or set of theories, from which observation statements are derived as tests of the theoretical set. A broader meaning of 'hypothetico-deduction', and the one employed here, goes well beyond a particular procedure of science to encompass our total conceptual apparatus and the logical relations which hold between the parts. In this extended sense, 'hypothetico-deduction' refers to the structural organization of our conceptual scheme and gives no logical priority to abstract theory over observation sentences. What matters is not the temporal order in which our conceptual framework is constructed, for each one of us will, by virtue of our individual histories, follow different paths of learning. What is important is the way all the parts are tied together - those theories of a more general sort hold the various observational parts together and tend to provide an explanation of them; the various observation items give the global theory its empirical content. Thus there is a reciprocal linkage between the general-specific and

the specific-general with the logical connection running both ways. The logical structure of hypothetico-deduction does no more than spell out the logical relations of the network - we can start just as well from simple observations to eventually arrive at some hypothetical explanation as we can initially begin with a hypothesis and generate some observation statements. In the final analysis, it is the coherence of the structure which is fundamental, a matter which far outweighs the researcher's more limited concern about where to begin a particular line of inquiry. Such, then, is the great advance in human thinking over the severely confined reasoning of induction. Now, we can talk of molecules and social classes, of periodic tables and justice, indeed, of all manner of things not previously available to us.⁵ Whereas our inductive generalizations are restricted to our direct, past experience, with the hypothetico-deductive method a higher grade of theoreticity is attained insofar as our generalizations, only indirectly supported by prior observation, are couched in the idiom of quantification and far exceed the resources required to articulate a generality obtained from induction over observation, and through revision of the theoretical network may resist unfulfilled prediction. While inductive generalizations owe their plausibility to the direct observations which collectively imply them, those of hypothetico-deduction owe whatever plausibility they possess only indirectly to their supporting observations, since it is not the generalizations themselves but their deduced logical consequences that are confirmed by observation.

Theories, or better still, theory formulations, are our starting point. Theories, as conceptual abstractions, serve us poorly; not until a theory is formulated as a set of sentences can implication and deduction obtain. The theory formulation, then, is a sentence - "typically a conjunctive sentence comprising the so-called axioms of the theory".⁶

It is at the point where theory formulations connect with observation sentences that a major difficulty arises; theoretical sentences are standing sentences, true for relatively long periods of time whereas observation sentences are occasion sentences, true or false on each occurrence. The gulf between the two classes of sentences must somehow be bridged since science cannot incorporate occasion sentences into its eternalized sentential structure. Somehow, occasion sentences must be reformed into eternal sentences. This can be achieved in two steps.

First, an occasion sentence must be pegged by place-time co-ordinates, so turning it into a standing sentence. Thus, the observation sentence "It is raining", being an occasion sentence, will not suffice. By pegging it we get "Rain at Massey University at 0935 on 8 May 1991", which, while still reporting an observation is nonetheless now a standing rather than an occasion sentence.⁷ Unfortunately, standing observation sentences are not only collectively unwieldy, they too fail to connect up with the theoretical sentences of science since the eternal sentences of scientific theory cannot imply any particular eternalized observation report, but only a generalized observation report which contains within its scope each and every relevant eternalized observation sentence. This generalized observation sentence, or observation categorical, allows us to dispense with the specification of time-place by generalizing over times and places as with the sentence "Where there is smoke there is fire".⁸ An observation categorical is a compound of observation sentences, being a generality according to which the initial conditions of the first observation sentence are always complemented by the circumstances of the second. The significance of this for inquiry will shortly become apparent.

Thus, we now have three grades of sentence connected in this manner: the theory formulation implies observation categoricals which in turn are checked for their truth against observation sentences. The observation categoricals give a theory formulation its empirical content for it is the observation categoricals, not the theory formulation itself, which connect with the observation sentences. The theoretical content of a theory formulation, on the other hand, consists of those sentences which imply but are not implied by the observation categoricals. The observation categorical thus provides the logical connection between theory and observation.⁹

This formal schematic structure of inquiry holds regardless of subject matter, and applies in the following way. Since our observations and self-evident truths, taken together, are not sufficient for explanation and future predictions or expectations, we devise hypotheses, or theories, to extend our reach.¹⁰ Although our theory formulations are conjectural, they are nonetheless informed conjectures - in the acquisition of a language the main theories are passed on in the process of preserving the continuity of cultural practices and new hypotheses do float relatively freely, somewhat adrift from the accepted bulk of theoretical doctrines.¹¹ Since our established global theory is a set

of interconnected sentences, any new theory formulations or hypotheses will have some linkage with them. Clearly enough, researchers espouse a hypothetical supposition because they hold that, if it is true it would reach back to cover the past and project forward to account for the future. In short, our theories are plausible stories devised to explain the unexplained, being both histories of what has gone before and expectations of what is yet to come.¹² A theory formulation implies its empirical consequences as a body, this being the sum total of a theory's observation categoricals.¹³

The observation categoricals, logically implied by the theory formulation, are conditional predictions of observations. But if the logical connection between theory formulation and observation categorical is one of implication, no such relation holds in their construction: a theory, already formulated, might only later be seen to imply a particular observation categorical. Such might be the case with researchers testing their theories. An opposite but no less familiar situation occurs when one or perhaps a few observations may lead us to propose a new observation categorical, in turn prompting a theoretical conjecture to explain it. Here perhaps is the anthropologist. Then again, there are also those occasions where the researcher, while not specifically concerned with a particular theory or hypothesis, happens upon an atypical circumstance at variance with an accepted observation categorical which, by virtue of its coherence with current theory, is held to be true.¹⁴ The observation categoricals, as the bearers of the empirical content of the theories which imply them, suggest that we will make these observations if we focus our attention on particular events, places or things, and if we adopt appropriate procedures which will aid observation. The observation categorical is thus the link between theory and observation.

Observation sentences, those reports of specific observations, are particular cases of observation categoricals limited by the specification of time-place, but nonetheless crucial to testing the truth of the observation categoricals and in turn the hypothesis or theory formulation.

The relation between theory, observation categorical and observation sentence is fundamental to theory testing. The theory is tested by the veracity of the observation categoricals which in turn are put to the test by observation sentences. At issue is the relation of evidential support, of evidence which can be mustered to establish the

trustworthiness of theory. The test of a theory thus depends on logical implication: on the one side we have our particular theory supported by our accepted background theories which taken together do the implying. On the other side is what is implied, the observation categoricals or generalities which can be tested. Any number of observation categoricals may be implied by the theoretical combination, so that the testing of the theory can proceed by testing any or all of them.¹⁵

The testing of an observation categorical hinges on paired observations. With an observation categorical of the form 'Whenever A then B', if observations A and B are affirmed then the observation categorical is confirmed, although not conclusively verified. On the other hand, where A is confirmed and B is not then the observation categorical is usually, but not always, refuted.¹⁶ Refute the observation categorical and whatever implied it is refuted. Thus, a refuted observation categorical will refute some part of the theoretical combination which implied it. Yet, just as accumulated confirming instances give us good grounds for continuing to hold to our accepted theory in the absence of evidence to the contrary,¹⁷ so too may the refutation of an observation categorical by an affirmative and a negative observation be aborted on rare occasions. Thus, the view that confirmation has no validity with refutation alone carrying the burden of theory testing must be tempered by recognition that with refutation the observations may either in some way be faulty¹⁸ or, as we shall see shortly, be rejected in order to save a well-established and widely accepted theory. On these rare occasions, the logical consequence of implication will be denied. There is thus a little more to confirmation and a little less to falsification than logic alone suggests.

Logically, a true sentence may be implied by other sentences which themselves can be either true or false while what implies a false sentence is itself false. Thus a confirming sentence can, via an observation categorical, support both true and false theories while a negative observation sentence, via an observation categorical, falsifies the implying theory. Accordingly, the conclusion to be drawn is this: more is to be gained by attempting to falsify a theory than establishing its truth for no amount of confirming instances will verify the truth of a theory but one contrary instance will establish its falsity. Unfortunately, the test of a theory is not as simple nor as neat as logic alone would have it. If it were the case that what implies an observation categorical was a single theoretical sentence, then the logic of refutation would hold thus -

$$(T \rightarrow O \cdot \sim O) \rightarrow \sim T$$

But as noted earlier, what implies an observation categorical is not one theoretical sentence as in the classical deductive syllogism; what does the implying is a bundle of such sentences which together constitute the theory in question in conjunction with additional auxiliary or background theory, including mathematical theory, the theoretical components of measuring instruments (eg. theories of intelligence) and such other theory as the initial test conditions require. To be sure, an observation contrary to the observation categorical leads to falsification of the implying conjunction, but not all of the conjunction need be rejected. Which part of the conjunction is deemed to be in need of revision is, of course, not a matter for logic alone to determine.¹⁹ The situation is this:

$$(T^1 \& T^2 \& T^3 \rightarrow O \cdot \sim O) \rightarrow \sim T^1 \vee \sim T^2 \vee \sim T^3$$

Which part of the conjunction to discard is a matter of pragmatic judgement - there are in principle many alternative ways of revising our conjunction to accommodate the observational inconsistency. Such revisions of theoretical sentences as are required to re-establish consistency can be made either in the theory under test or in the background theories.²⁰ So, the theory can be saved if revision is made elsewhere in the system.

In detail, the situation is something like the following and applies to any theory under test, whether it be a more formally structured laboratory experiment or informal observation in a natural setting.²¹ Suppose, for the sake of an example, that a social researcher sets up a situation to test a particular theoretical statement S. With the help of other theoretical sentences (let us call them T, U, V, W, X and Y which with S constitute set #) an observation categorical Z is implied. If S is true, whenever a certain observable condition specified by the observation categorical Z is set up, a certain consequence should be observed. The researcher proceeds to test S by putting Z on trial; this is done by arranging a certain observable state of affairs (the initial conditions) to determine whether a predicted observation results. Experimentally, the 'whenever' side of the observation categorical is organized in such a way that the 'then' side should follow. If it does, S is confirmed, in which case S may be true and so can be provisionally included in our global theory; if not, then the body of theoretical statements can be worked through to locate one or more in need of revision. Although the options open to

the researcher are numerous they can be broadly reduced to (1) theoretical hypotheses, (2) initial conditions, (3) observable consequences and (4) the principles of logical implication employed to derive the observable consequences.²²

Theoretical Hypotheses: The theoretical sentences of # consist of S, T, U, V, W, X and Y. S is the theoretical sentence under test, and let us say that T, U, V and W are similar theoretical sentences, X is a logical truth and Y is a mathematical sentence. In the face of a contrary instance we could revise one or more of S through Y by amending that which we had least confidence in. Now, some members of # may be excluded; (a) those sentences, let us say W, which we may determine are irrelevant since implication still holds without their help, (b) any logical truth, such as X, which adds nothing to what # already implies, and (c) any mathematical truth, such as Y, for mathematics pervades the entire global theory and its revision would bring chaos to the system.²³ Of the remaining members of #, the researcher may well begin with S since this is the particular sentence that was initially up for testing, and is the *prima facie* candidate for rejection. So S is rescinded, but if the remaining sentences of # still imply the observation categorical then another sentence (eg. T) may instead be rescinded, or a combination of sentences (S and T) revoked, until such time as the offending sentence (let us say V) of # is removed and a valid implication restored. Not that this is the end of the matter. By rejecting V we now need to identify those sentences elsewhere in our global theory which implied V, let us say sentences A, B, C, D and E which constitute set *. The process applied to # must now be applied to * in order to weed out from * those sentences primarily responsible for implying V.²⁴ Success in defusing the false implications is one thing; being able to explain the 'how' or 'why' of the contrary observation is quite another matter requiring further scientific investigation which may or may not resolve the problem.

Initial Conditions: The researcher might turn to the setting up of the actual test situation and look to rejecting the statement of the initial conditions.²⁵ Thus, a social researcher may conclude that the measuring instrument, such as a questionnaire, did not adequately provide the sort of evidence required to test the theory. Alternatively, fault may lie in the background theory required for testing, such as the theory associated with intelligence tests. Thus, where instruments are used to make observations (eg video, audiotape, questionnaires, standardized tests, etc) the option remains open to

revise the supporting theoretical assumptions so as to re-establish consistency.

Observational Evidence: Our observation statements or the observational evidence could also be considered for rejection. Observation sentences are theory-laden since they employ theoretical vocabulary drawn from the theory under test, the auxiliary theories and the supporting theories associated with the test procedures. In which case, the worth of observation data as empirical evidence is only as good as the theory from which such vocabulary is derived. At a later date we might decide that our descriptions of what was previously observed do not adequately represent our experience, and so we revise them accordingly.²⁶ Equally, the evidence contained on video might be denied rather than rejecting the supporting physical theory of optics presupposed by the camera lense. Alternatively, there could be errors in the recording of data or in the statistical analyses, both of which are frequent sources of error. Thus, decisions about which sentences to retain and which to give up are not always easily made. Beyond observation sentences which carry empirical content, there is no simple touchstone for our theoretical network; because of the underdetermination of theory, empirical evidence is distributed across the network as a whole rather than allocated to individual sentences, and even observation sentences can be revised. So there is no absolute empirical foundation for our theory, but our observation sentences are about as good as we can get.²⁷

Logical Implication: The last option available is to examine the principles of logic involved in the deduction of the observation categorical. As with mathematical truths, the laws of logic would be the very last to be amended. But a logical error in the deduction of the observation categorical is quite another matter.

If logic dictates that no one or more members of a body of theoretical sentences can be fingered for revision in the light of contrary evidence, then logic alone is insufficient in determining where revision should be made. Even if irrelevant portions, logical truths and mathematical axioms are excluded, there is still much to choose from within what remains. Furthermore, insofar as our theories are underdetermined by the empirical evidence, there can be rival theories, each implying the data. Evidence confirming one theory may confirm many, being good for all and not just one. Empirical adequacy is only one epistemic virtue, and a limited one at that. Thus, in adjudicating either among conjunctive theoretical sentences internal to a test situation or more

broadly between two (or more) competing theories, supra-empirical criteria will be necessary against which we can begin to establish the superiority of some sentences or theories over their rivals.

The Supra-Empirical Principles of Normative Epistemology.

How should we make rational revisions to our theoretical framework? What principles ought we to apply in making decisions about evidence and theories? What weighting should be given to each principle? Such are the central questions of normative epistemology which lie at the heart of naturalized epistemology.²⁸

Because theories are underdetermined by the evidence and any number of theories could account for the evidence, there is latitude for pragmatic considerations to enter into judgements about how to revise the theoretical network. The considerations are these: (a) absence of a replacing theory, (b) conservatism, (c) modesty, (d) precision, (e) generality, (f) simplicity, (g) parsimony, (h) fecundity, (i) refutation and (j) robustness.²⁹

Absence of a Replacing Theory: Where an existing theory explains a good deal but is confronted with anomalies, unless there is another theory available to replace it, there is no compelling reason to reject it. Either, revision needs to be made elsewhere in the system or a superior replacing theory must be sought.³⁰

Conservatism: A dominant guiding principle is that of familiarity, or least revision. Where a new hypothesis conflicts with none of its supporting theory, then conservatism usually prevails and the new is incorporated speedily into the old. Where a new theoretical formulation is irreconcilable with the rest, acceptance of the former would require rejection of whatever is in conflict with it. When assessing whether to accept novel or prior theory, the familiar which has withstood the test of time tends to hold its own. It is thus generally prudent to adhere to accepted theory rather than gamble on bold conjectures by applying the 'maxim of minimum mutilation' to save the old theory from drastic revision. In Quine's picturesque phrase, "such is the mutilation that the maxim of minimum mutilation is meant to minimize."³¹ Consequently, the less revision of prior theory the more plausible is the hypothesis under consideration.

Modesty: The principle of modesty works in two ways. Logically, one theory, hypothesis or sentence is more modest than another theory, hypothesis or sentence if

the former is implied by the latter but does not imply it. (Thus, sentence 'A' is more modest than sentence 'A & B' since 'A & B' implies 'A' but 'A' does not imply 'A & B'). Empirically, of two theories or sentences, the one which is more humdrum, the one which is more restricted to everyday phenomena, is the more modest. Modesty prevails in securing conservatism.

Precision: While the principle of precision does its work, it stands in a supplementary position to its kindred principles. Since many theories are formulated in such ill-defined terms, it is difficult to specify exactly what they are ontologically committed to and what sort of evidence would count against them. The more precisely a theory can be stated the more exactly it can be tested. This can be achieved by introducing quantitative terms into the hypothesis which makes measurement of one sort or another possible. However, precision is not limited to measurement alone. Another strategy is to tighten up the terms of the theory by either giving precise sense to what was vague or inexact, or redefining what was fuzzy by replacing it with another already available or a newly constructed term. By doing so, the term may be made more precise in its application by referring to some things not previously denoted and no longer designating some things covered by its extension.³²

Generality: The principle of generality promotes scope - the more unified is our body of theory the more is brought under its cover. Thus, a conjunction of theoretical sentences will imply a wider set of observation categoricals than would the same sentences disjunctively. Generalization beyond the evidence is grounded in two sources - the natural route to generality is by induction extrapolating from observed cases to all possible cases by framing a general sentence. The other source, the hypothetico-deductive, devises a generalization ripe for putting to the test. Either way, greater explanatory value is critical for theory testing; successive test situations are never exactly alike, so if numerous observations are to bear upon the theory then the theory must be general enough to gather in not only the relevant tests to date but also relevant future ones. Thus, a theory generalized encompasses more than just what has been observed; it also predicts what will be observed. It is generality which makes a theory interesting and, if true, of considerable consequence.³³

Simplicity: The principle of simplicity is paramount if theory is to be manageable. Simplicity alludes to logical simplicity and not to making a theory psychologically simpler

to understand since a logically simple formulation of a theory may be psychologically difficult to grasp.

Where either clarification or reduction is achieved there is a corresponding gain in simplicity. The elucidation of obscure theoretical constructs by their translation into the idiom of logical notation is one strategy to keep theory simple, especially where the sentences of ordinary language are concerned: they are regimented by canonical notation into a form suitable for their coherence with the rest of our scientific theory. Paradoxically, social researchers may have to complicate their theories by invoking new terms to accommodate new evidence, but the test of simplicity still applies. Reduction in the number and variety of sentences required for full coverage of the evidence also conduces to simplicity. The simplest theory is the one which, compared with its rivals, covers as much or more than they do with a fewer number of assumptions. The simpler the theory the more readily are relevant matters contained since less theoretical postulates are required to admit a vast array of posits. The unity of theory, the coherence of seemingly disparate parts into a global whole, is the goal of simplicity. However, simplicity is by no means a precise notion, since the degree of unity is grounded by our current vocabulary.

Simplicity is in the ascendancy prior to the testing of a hypothesis, and since decisive checking may be long delayed or not even possible, then simplicity may on occasions be the ultimate arbiter of a theory's worthiness. Thus, at the time of their formulation, theoretical sentences may have little but their systematic simplicity to recommend them: the theory which is most conducive to maintaining, or even enhancing, simplicity is the one most likely to succeed. The search for simplicity is guided by the dictum that the systematic simplicity of the global network is at the expense of the simplicity of particular theories: the simplicity of a part of the linguistic structure is sacrificed if there is a way of obtaining greater simplicity of the whole. When choosing between two hypotheses for revision, why retain the simpler? Not because the simpler may be true, for we cannot assume that the simple theory is necessarily the true theory. Rather, the simpler the theory the less chance of going astray, since it makes fewer assumptions.³⁴

Parsimony: Don't advance further from empirical evidence than is necessary is the principle of parsimony. The fewer theoretical entities posited to account for sensory

experience the better: in addition, those theories which posit unobservable entities are less parsimonious than those which do not except when they explain more.³⁵

Fecundity: The principle of fecundity gives greater weighting to that theory which is the more intellectually productive. A theory is fertile insofar as it can be extended to encompass new evidence and is thus to be preferred over one that has very limited further development or none at all.³⁶

Refutation: The principle of refutation demands that a theoretical conjecture be refutable if it is to serve empirical science. Not that the hypothesis is refuted, for it may not be and may never be, but rather that it is refutable if some evidence, recognized as such, were to count against it. But the principle of refutation is tempered by holism - any sentence, any theory, can be held come what may in the face of recalcitrant evidence if radical revisions are made elsewhere in the theoretical network. While all the sentences of the network are, in principle, refutable, the measure of their refutability is one of degree. If retaining a theory comes at the cost of rejecting other widely accepted bodies of theory, then the less we are prepared to sacrifice our background system to save a particular hypothesis, the more refutable the hypothesis. Equally, a theory which coheres with existing theory has a low level of refutability.³⁷

Robustness: The principle of robustness holds for those theories which have withstood the force of evidential challenge. Where the testable consequences of a theory, the observation categoricals, have survived repeated testing, the theory is well placed to resist revision.³⁸

Decisions about what weightings to accord the various principles when considering revisions in our theoretical system cannot make appeal to a simple calculus of relative worth. On any one occasion, not all principles may apply, and when they do their contribution may vary from one occasion to the next. Not infrequently, two or more principles may interact to add complexity to the issue.

Where a social researcher extrapolates from the available evidence to generalize across more cases than observed, the extrapolation is guided by the principle of simplicity. For example,

Let * be a theory, and let C be the class of all testable consequences of *.

The theory * will have been suggested to us by some set K of prior observations, a subclass of C. In general, the simpler * is, the smaller the

sample K of C that will have sufficed to suggest *. To say this is just to repeat the earlier remark: that simplicity is what guides extrapolation.³⁹

Thus, the simpler the theory the less evidential support required and the greater the scope of unconfirmed coverage.⁴⁰ Fecundity relies on simplicity and conservatism since both of these are conducive to enhancing a theory's productivity. Considerations of simplicity and conservatism may vary in where the weighting falls: prima facie, we should go for the theory which requires the minimum of mutilation, the one which departs least from existing theory. However, as old theories are modified in accordance with the principle of conservatism, a time may come when the much amended theory gives way to a radical revision which simplifies the old. While a sophisticated simplification may demand sweeping changes, there are limits and the pull of conservatism will nonetheless be felt for vast tracts of our current theory which will hold steady.⁴¹ Generality conflicts with modesty: modesty seeks the smallest gains while generality the largest, but generality adds to a theory's utility. Yet, if generality is secured at the expense of simplicity, nothing is gained. However, if generality is enhanced without loss of simplicity or if there is further simplification with generality preserved, then the principles of conservatism and modesty are surrendered.⁴²

There is no formula for guiding practice in dealing with questions of normative epistemology. When should we be conservative in dealing with our theories and the evidence, and when, in Kuhn's terms, should we be revolutionary? If we are forever counselled by the principle of conservatism we will fail to systematize radical revisions which may bring with them greater generality and simplicity. Equally, constant radical revision gives no opportunity to establish a steady body of scientific theory. Arbitration of competing principles then becomes a pragmatic process with the 'maximization of simplicity and the minimization of mutilation' being the maxims first and foremost.⁴³

So far, the issue of theory competition has been considered largely in the abstract. The key epistemic values have been brought to the fore and their weightings considered. A central philosophical problem in the naturalist project now needs to be considered within the context of theory assessment: in our explanations of human behaviour in educational organizations, should we retain the traditional intentional stance rooted in beliefs/desires (or 'folk psychology' as it is sometimes called) even if it fails to cohere with the rest of our scientific theory, or would we better advised to seek

out an alternative theory, perhaps very different from our current commonsense one, which is nonetheless consistent with our other empirical theories of the world? In the next chapter, the case for a neuropsychological theory of human behaviour will be made in conjunction with the argument that the admission of such a theory into our global theoretical system brings with it the elimination of folk psychology from our explanatory framework.

NOTES

- 1 There simply are no grounds for supposing that philosophically we can define the realm of science prior to doing science. Only when science becomes a 'going concern' could some account of it be given, and as it has progressed through an expanding body of theory and evidence so too has it become possible to further clarify the scientific enterprise. Insofar as the evidence for science is ultimately grounded in sensory experience, then the study of science is itself a science. Thus, instead of attempting to mark out the meaning of 'science' by analyzing the term, what science is is determined by its defining characteristics of the time - the notion of physical objects, the four dimensions of space-time, the true-false dichotomy of two-valued logic, all of which may well be revised as science progresses. While the two accounts of science do not exhaust the possibilities, they are nonetheless widely recognized as leading candidates for the title of science. The importance of the classical notion lies in its non-elitism insofar as anyone can pursue scientific inquiry into almost any subject (Quine & Ullian, 1978, 3). What, then is the purpose of science? Many candidates have been proffered as the goal of inquiry, including explanatory understandings of how things are, control and modification of the world, prediction, and such personal ambitions as pride, fame and fortune. However, there simply is no *one* purpose which serves science, but many, none of which can be denied their claim as a goal of science. Although Haack (1990, 118) acknowledges that many candidates have been suggested as the goal of science, her preferred candidate is "getting as complete as possible a true, explanatory account of how things are," Admirable as this may be, Quine (1990c, 128) in his reply is surely correct when he points out that there are many purposes of science, none of which can be ruled out in favour of one. All have their place, perhaps differentially, regardless of whether we approve of their inclusion or not. Now, while prediction can be a purpose of science it, unlike the others, is also a test or checkpoint of a scientific theory whatever the purpose. From a purely practical perspective, the efficacy of science lies in prediction, of an expectation fulfilled, regardless of whether the coverage is of past or future events. And, in its own way, the conjecture come true is no less to be sought and found in common-sense than it is in science itself.

- 2 A young child may, on the grounds of physical resemblance and habit, initially classify whales as fish, and only later come to realize, by applying theoretical concepts, that whales, as mammals, are biologically more akin to humans than their piscine neighbours.

- 3 So too do countless species of the animal world - a mouse is able to apply similarity standards to Tom and his brethren to inductively grasp that all cats are its enemy.

- 4 Quine, 1969, 125-6.
- 5 In his discussion of empirically equivalent systems of the world, Quine (1975c, 313) makes the point that scientists of whatever persuasion create hypotheses that refer to non-observable entities.
- 6 Quine, 1975c, 318.
- 7 The question of how we get from the simple observation sentence "It is raining" to the standing sentence "Rain at Massey University at 0930 on 8 May 1994" can be explained thus: we begin with the observation sentence "It is raining" and combine it with a further observation sentence "Here at Massey University" to arrive at the compound observation sentence "Rain at Massey University". Although still an observation sentence, the occasionalism can be remedied by adding two further observation sentences; "My watch reads 0930" and "The calendar reads 8 May 1994". The conjunction of all four observation sentences - "Rain at Massey University with watch at 0930 and calendar at 8 May 1994" remains an observation sentence but is no longer an occasion sentence. It has now acquired the status of a standing report of an observation, giving lasting information, which is a requirement of a scientific theory (Gochet, 1986, 116; Koppelberg, 1990, 208; Quine, 1975a, 75-6; 1981a, 26). In a similar vein, other indicator words such as 'I', 'you', 'here', 'now' and the like are replaced by personal names and equivalent descriptions of time and place. Sentences so rephrased are regarded as tenseless.
- 8 Other constructions include 'If this, then that', 'Whenever this then that' and so on. The mark of a good theory lies in its predictions withstanding the search for contrary evidence. But successful predictions are not enough. Explanation is required. An observation categorical, consisting of two observation statements, predicts invariant association or constant conjunction but leaves open the question of how the two phenomena are causally connected for no mechanism is postulated. A hypothesis or theory is explanatory when it advances a causal connection: an explanation stated in terms of physical theory points to the causal chains and causal mechanisms of human behaviour. It goes without saying that science should favour the search for and the discovery of causal mechanisms over the mere talk of dispositions and causes. Ullian (1990, 338) points out that the term 'cause' is often used when we do not understand the mechanism by which related events are connected. We say 'A caused B' in just those cases, but not when a causal mechanism is at hand. Thus the word 'cause' serves as a dispositional term to signal a causal mechanism of which we are ignorant but which we might one day discover. If the ordinary person in the street suffices with 'cause' the philosopher and the scientist should not, for neither should be satisfied with the view that causes cannot be fully understood.
- 9 Koppelberg, 1990, 208; Quine, 1981a, 26-8. An observational categorical is implied by a set of theoretical sentences having 'critical semantic mass'; that is, the set is sufficiently inclusive to logically imply the observation categorical. The empirical check of the set of theoretical sentences lies in testing the implied

observation categorical in particular cases. Implication holds the whole together - logic links theory formulation and empirical testing via observation categoricals by virtue of the shared vocabulary of observational and theoretical sentences.

- 10 An impression might be gained that the hypothesis building of the hypothetico-deductive method stands in marked contrast to inductive generalization. This would be a mistake: both hypothetico-deduction and induction go for hypothesis, only that induction, restricted to extrapolating from similarities, is a limiting case of hypothesis. On the other hand, a form of hypothesis not wanted is the ad hoc hypothesis which attempts to account for a particular set of observations, often troublesome ones which we are unable to explain, by assuming extraordinary dynamics to be involved in such instances, and certainly not generalizable, so that the hypothesis is limited to covering only those observations for which it is contrived, and has no predictive value.
- 11 We are born into a culture and inherit the main theories - we learn them early on in childhood. In addition, many of these are retained either because they are sort of self-evident, common-sense, supported by authority or have so far worked out successfully. The linguistic network is constantly revised as each and every one of us adds and eliminates hypotheses in our daily lives. While we all make minor revisions to the network in our own way, the really big revisions tend to lie in the work of scientists.
- 12 The importance of hypotheses looking both ways, to the past and to the future, augers well for educational research. As Quine and Ullian (1978, 108) point out,

The immediate utility of a good hypothesis is as an aid to prediction. For it is by predicting the effect of our actions or other observed events that we are able to turn our environment to best advantage. A good hypothesis can serve also, conversely...by accounting for events already observed....(T)he hypotheses that we seek in explanation of past observations serve again in the prediction of future ones.

History, as a hypothetical account of past events, admirably fits the picture.
- 13 Although a theory formulation implies all of its observational categoricals, it is not implied by them. Theory formulation and the empirical content of a theory are not equivalent, a conclusion anchored by the empirical underdetermination of theory (Barrett & Gibson, 1990, xxi).
- 14 Quine, 1990a, 14.
- 15 The question of just how precise a theory formulation ought to be is not easily answered. A theory stated in precise terms, while permitting ease of implication, with background theories jointly implies an observation categorical so is sometimes hard to set apart for testing; conversely, a theory stated in imprecise terms hinders implication so is also hard to test. On balance, precision has more going for it.

- 16 As an example, take the observational categorical 'Where there is smoke there is fire'. We may observe smoke but not fire as in the case of a smoke bomb. While there may be a chemical reaction, there is no fire in the normal sense of the word.
- 17 What confirms a theory, or hypothetical conjecture, is the success of its predictions. Where the hypothesis is a generalization obtained inductively, the predictions are instances of the generalization. With a law-like generalization its instances add to its confirmation - while not clinching the truth of the generalization they do add to its plausibility until such time as a false instance comes to hand (Quine & Ullian, 1978, 101-2).
- 18 As with the observational categorical 'Whenever we observe a swan then it will be white', the observation of a black swan need not necessarily refute the observational categorical if the observed bird looks like a swan but isn't or is a white swan covered in oil or our glasses distorted what we saw, and so on.
- 19 There is no mechanical method or system of logic which allows us to determine where the error lies. As Churchland (1986, 262) points out, the theory can in principle be protected and falsity found elsewhere in the supporting theory. Logic can tell us that somewhere in our theoretical assumptions there is a falsity but nothing in deductive logic is able to guide our decisions about which assumption(s) it is rational to declare false.
- 20 There will be many occasions when our observations accord with our observational categoricals and hence confirm the conjunction of theoretical sentences. The force of confirmation is not to be underestimated as White (1981, 27) cogently argues:
 The scientific tester who focuses his attention on one statement may well concede that...(this)...is what he has confirmed *on this occasion* simply because he accepts all of the other conjuncts. This not to say that they will have been previously established in isolation. On the contrary, they too have been established as conjuncts of other conjunctions from which they will have been extracted and used as reliable assumptions in the deductive argument that helps the tester confirm...(the statement)....They will have earned their credentials in some earlier test. That is why they will have been relegated to the background as stable or reliable assumptions; and, for this reason, the experience that confirms a conjunction of these stable assumptions *and* the hypothesis in which the scientist is interested at a given moment may sometimes be thought of as confirming the latter only.
- 21 The notion of a theory under test should not be rigorously defined as an experiment. In our daily lives even our common-sense theories are put to the test, sometimes prospectively and on other occasions retrospectively, sometimes systematically and other times quite casually. In other words, all theories are put to the test.

- 22 Orenstein, 1977, 83-4. Suppose that from a conjunction of ten theoretical sentences a social researcher deduces a sociological prediction and the prediction fails. It is more likely that revision will be sought in, say, the five sociological hypotheses than in those more general assumptions about bodies, logic and mathematics. While such a strategy may in practice appear to narrow the field in search of that portion of the theory responsible for the failure, in logic the full set remains culpable. Reasonably, perhaps, not even the five sociological assumptions will be equally viewed with suspicion: it is more than likely that one of the five will be fixed upon, perhaps the one that was initially selected for testing. The one under suspicion may be rejected along with those that imply it; on the other hand, it may not, so as other hypotheses in the sociological set are scrutinized, it becomes clear that the process is not one of examining a single theoretical sentence while guaranteeing the rest but is rather a matter of, in principle, holding all items in the conjunction as suspect, even if some are more suspect than others.
- 23 This is not to say that mathematical advances do not bring revisions to mathematics, for clearly they do. But any revisions made are usually the result of mathematical and logical inquiry, and not simply of empirical researchers amending branches of mathematics to accommodate observational data. Thus, social researchers would be wise to search for revisions in some more empirical part of the linguistic system where such amendments would not have such calamitous repercussions.
- 24 Quine, 1990b, 11; White, 1981, 25-6.
- 25 This is sometimes done in research and often in science education where a chemistry teacher might reject the findings of a student's experiment which clashes with widely accepted theory because the experiment had not been properly conducted.
- 26 Churchland (1986, 263-4) observes that on occasions it may be reasonable to revise an observation sentence, or reinterpret what was observed, since the day to day practice of social research is considerably messier than philosopher's theories of observation. Thus, in practice researcher's observation statements are not totally infallible but may be amended at a later date. As researchers read the current literature on the problems they are tackling, and make further observations of their own, we become progressively clearer about things. In the main, this growth is one of gradual revision of our global theory, being continuous with the past and no different in kind from the testing of common-sense talk.
- 27 Our observation sentences are the best we have for anchoring our conceptual scheme to reality, but even they are fallible since we have no means of representing the empirical world apart from theoretical assumptions which themselves can be revised. Furthermore, on some occasions we may be compelled to choose between rival conceptual structures for representing empirical content so the choice cannot be made by determining their empirical adequacy to some common touchstone since the touchstone is itself

problematic. Instead, appeal must be made to supra-empirical virtues.

- 28 Critics of naturalized epistemology occasionally claim that such an epistemology is descriptive and therefore rules out normative considerations. Not so. As Quine (1990a, 20) points out, naturalized epistemology has both a descriptive and a normative side. On the descriptive side is empirical investigation by psychology, neuroscience and the like to determine how the brain theorizes. On the normative side lie the criteria for theory appraisal, in particular those identified by Quine and Ullian (1978) and Churchland (1989, 139-47).
- 29 Although these criteria are widely held by epistemic naturalists (Churchland, 1989, 139; Churchland, 1986; Gibson, 1982, 169; Orenstein, 1977, 53-5; Quine & Ullian, 1978, 66-73) they are a requirement for any normative epistemology. They may even be more important than empirical adequacy since collectively they can displace a whole conceptual structure employed to portray a portion of empirical content.
- 30 Churchland, 1986, 263.
- 31 Quine, 1990a, 15.
- 32 Gibson, 1982, 123; Orenstein, 1977, 56; Quine & Ullian, 1978, 98-9.
- 33 Quine & Ullian 1978, 73-4. A theory with greater explanatory power or generality can explain more phenomena than its rivals. Newtonian mechanics is a good example of generality. Newton demonstrated how previously disparate laws of motion for heavenly and terrestrial bodies could be subsumed under a more general set of laws (Orenstein, 1977, 53).
- 34 Quine & Ullian, 1978, 69-71. Of two rival theories, other things being equal, the simpler theory makes fewer assumptions. For example, the Copernican view that planets orbit the sun contradicted the Ptolemaic theory of the sun and the planets circling the earth. At the time, both theories were empirically equivalent in that there were no observed empirical differences between them. However, the Copernican theory was able to explain the same empirical evidence with fewer assumptions.
- 35 Orenstein, 1977, 54; Quine, 1973, 138.
- 36 Quine, 1966, 234.
- 37 Quine & Ullian, 1978, 79.
- 38 Quine, 1966, 234.
- 39 Quine, 1960, 20.
- 40 In choosing between two rival theories, we would look to the one having greater simplicity and fecundity. Where two theories are empirically equivalent with respect to actual observations, they may not be equivalent in regard to the class

of possible observations (Gochet, 1986, 124-5).

41 Quine, 1973, 234.

42 Churchland, 1989, 147; Quine & Ullian, 1978, 74-5.

43 Churchland, 1986, 263; Quine, 1990a, 11.

CHAPTER NINE

THEORY REDUCTION AND EXPLANATIONS OF BEHAVIOUR IN ORGANIZATIONS

Although the supra-empirical virtues of normative epistemology play a crucial role in theory adjudication, the question still remains as to what sort of relation, or set of relations, obtains between theories. Within the global theoretical network, the bulk of our many and varied theories (the physical theories at least) are complementary in their explanatory range and their co-existence, failing a significant revision of the system, is assured for the time-being. Minor additions, consistent with the whole, are regularly incorporated; thus, in small ways, does our network continue to grow. However, growth of any consequence is seldom smoothly incremental since epistemic advance is usually marked by the favouring of one theory over another. Where two theories clash, resolution of their rivalry falls anywhere on a continuum, from an untroubled identity reduction of a theory by its competitor at one end to the complete elimination of an opponent at the other extreme, with varying degrees of retention/elimination across the spectrum.

THEORY REDUCTION

In those relatively rare instances of ideal reduction, one theory is reduced to another in such a way that the terms, sentences and laws of the old theory, by virtue of a set of correspondence rules, are mapped on to, or are identical with, a subset of terms and sentences (but not necessarily laws) of the new theory where the latter are either general theorems or are logically derived from the laws, axioms and principles of the reducing theory. In an ideal reduction, the old theory is fully preserved within the rubric of the new since the latter comes to occupy the conceptual domain of the former. The upshot of this is two-fold. First, the displacement of the old theory by the new is an orderly one requiring revision of neither the reducing or reduced theories nor the background theories of the global network. Second, the confirmatory evidence for the

reduced theory carries over and is incorporated into the corroborative support for the reducing theory. Such, then, are the virtues of ideal reduction when ideal reduction is to be had, but reductions are seldom ideal and as we move further away from the 'best case' both of these qualities are progressively lost.¹

As reduction moves along the continuum away from the ideal, there is a slippage in identity. No longer can the terms, sentences and laws of the old theory be smoothly mapped on to a set of expressions of the new. Whereas with ideal reduction the reduced theory can be deduced from the laws of the reducing theory, this strategy is not available to reductions where identity does not obtain. It may be that while much of the old theory does reduce smoothly to the new there are some central principles of the reduced theory which are just plain false. Or, various laws of the old theory may require modification, minor or substantial, before they can comfortably fall into place in the conceptual scheme of the reducing theory. The logical point to be made is this: since most reduced theories are false, at least in part if not in full, then if reduction is deduction, modus tollens would dictate that the laws of the reducing theory are themselves false which is contrary to their supposed truth value. What must be resisted is the notion that in reduction the reduced theory can be deduced from the reducing theory. Since the former cannot be deduced from the latter, the only route open is by way of intermediary theory formulations. Where the old theory does not readily find a place in the new, three possible avenues are available: **(1)** an analogue (T_o^*) of the old theory (T_o), closely similar to it, becomes embedded in the reducing theory (T_n) and is deducible from it; **(2)** an augmented theory (T_n^*) closely similar to the new theory (T_n) may permit the deduction of the reduced old theory (T_o); **(3)** both the old (T_o) and the new (T_n) theories may require parallel constructions, so are related by way of T_o^* and T_n^* .² The most common strategy is the first, where a reduction is effected thus: the deduction within T_n is not to T_o but to T_o^* , this being an equivalent representation of T_o but expressed in the vocabulary of T_n . Both T_o and T_o^* encompass the same empirical territory - they are parallel, partially correct accounts of the same set of objective properties. The difference is that T_o^* is embedded in the more comprehensive conceptual scheme of T_n . The analogue T_o^* is thus deducible from T_n . (The analogue permits the reduction of a false theory by a true theory).

Theories range themselves across the spectrum according to how closely the old

theory is mirrored in the analogue of the new theory. Where there is a close mapping of the content of the old on to the new the reduction is relatively smooth and tends towards the ideal. Where matching of the properties of the old and the new requires major reconfiguration of a corrected version of the old theory, then increasingly the analogue becomes less and less an approximation of the original, until such time as the corrections are so massive that no matching is achievable. The conceptual structure of the old theory is so systematically in error that there is little or nothing worth saving, so it is eliminated outright.

There is an important temporal dimension to reduction. Rarely, if ever, do first formulations of theories reduce. Rather, reduction is more often the end-point of a process of co-evolution: two theories co-evolve, growing and maturing over time, each enlivening, modifying, revising, extending and curbing the other. With mutual correction and advance, there is a closer knitting together of the pair so that reductive linkages are formed and developed. From this slow unfolding emerges major revision of the categorial and ontological constitution of the coupled theories, with reduction falling somewhere along the spectrum. Yet, typically, the co-evolution favours one theory over the other: sometimes the modification is conservative and permits retention of categories and ontology; other times, the co-evolution is so radical that elimination is accompanied by an enormous overthrow of conceptual structure and ontic commitment.³ A vital point to be grasped is this: reduction, first and foremost, is the reduction of theories - it is the relation between one theory, the reducing theory, and another theory, the reduced theory. A distinction can therefore be drawn between the reducing of one theory to another and the reduction of one ontology to another. The first entails the second only on those rare occasions of ideal, or near ideal, reduction which licences intertheoretic identity. The reduction of one phenomenon, or set of phenomena, to another phenomenon or set of phenomena, is parasitic on the success of one theory being reduced to another. One substantial gain accruing from intertheoretic reduction is ontological simplification of what entities and properties there are. Such simplification may be accomplished in several ways: when the reduced theory is to some extent retained, then it may be that where originally it was supposed that the two different theories called for two distinct types of phenomena, only one class of entity is actually assigned. Much the same result flows from elimination where one

ontology is done away with. Concomitantly, the empirical evidence for the old theory (To), except for identity reduction, is not usually made over to the new; certainly, whatever evidence is inherited is generally not that expressed in the lexicon of To since the conceptual resources of To and Tn are mismatched. What is acquired is the sensory experience of the old theory which requires paraphrasing if it is to serve as evidence for the new. In the end, however, although concepts and phenomena may be reduced or even eliminated, the stuff of the world remains - it is what it is and stays so as theories about it are advanced, reduced and eliminated.⁴

The point of reduction, right across the spectrum, from complete retention to total elimination, is to demonstrate how the new theory has a superior set of resources that allow it to match the explanatory and predictive power of the old theory without loss while also explaining and predicting more where the old theory failed. In short, the new theory accounts for all that the old could explain and more besides. Determining quite where a particular reduction will fall on the continuum is no simple matter; whatever criteria there might be are crucially ameliorated by a variety of pragmatic, social and personal considerations which will influence decisions about identity and retention, or the lack of and thus elimination. Perhaps the absence of a clear-cut set of criteria is unimportant - what really matters is that the replacing theory is superior to that replaced in terms of its explanatory power and contribution to enhancing theoretical systematicity.⁵ No wonder then, that in empirical science intertheoretic reduction is so highly prized.

THEORY REDUCTION AND FOLK PSYCHOLOGY

There was a time, way back in antiquity, when our distant forebears first began to speculate on the nature of the world. Although their earliest efforts are no longer a matter of public record, later conjectures on such aspects as the heavenly bodies, weather, geological processes, flora and fauna, and of themselves, were simple accounts of how things were taken to be. Often, such descriptions and explanations were couched in animistic terms - Gods were invoked to explain thunder, lightning, earthquakes and the like, spirits were appealed to as the life force, and minds conjured to distinguish man from beast. With the rise of modern science, Gods were replaced by physical forces as explanations of natural events and spirits gave way to DNA. Indeed,

the advances of recent science have largely eliminated the simplistic notions of folk physics, folk chemistry and folk biology. But not so folk psychology, where commonsense has been most stubbornly defended in the face of increasingly strenuous efforts to dislodge it by the gains of empirical psychology and neurophysiology. Whereas we have been prepared to give up our folk explanations of the world around us, our folk psychological explanations of ourselves have endured, not because they are true since they are probably not, but because they have not until recently had any serious contender to replace them. However, now as never before, a viable materialist rival is emerging which in time could succeed in perhaps smoothly reducing, or more likely completely eliminating, our commonsense theory of minds and mental states as an adequate account of human cognition and behaviour. If, through intertheoretic reduction, folk psychology is to be replaced by a neuropsychological rival, then it is important to establish the nature of both the reducing and the reduced theories, especially if the reduction is one of complete elimination.

Humans have long been interested in their own behaviour, of explaining the relations holding between their external causal circumstances, their own covert inner psychological states, and their overt physical conduct. Few explanations of human behaviour have been so long-lived or more influential than our current everyday conception, with roots going as far back as Aristotle and transmitted generationally through children acquiring the language of their community. Indeed, so pervasive is the idiom of commonsense that it has become quite natural to think and speak in such terms. Beliefs, desires, intentions, fears, and the like are invoked to account for what we and others do - eg. she took an umbrella because she believed it would soon start to rain. Mental states are thus imputed to explain deliberate action (as against those involuntary motions which can be explicated by reference to purely physical causes). Of course the concepts of folk psychology do much more work than just explanation and prediction. The language of everyday life is used to promise, to greet, to congratulate, and the like. But the integrity of the propositional attitudes lies in their empirical base and theoretical soundness.

Since the mid-1960s the commonsense view has, at least amongst philosophers and psychologists, been given the label of 'folk psychology' to distinguish it from those theories of a more scientific genre. That it can be so distinguished rests not on some

supposed epistemic line that can be drawn between theoretical science and non-theoretical commonsense, but on the more mundane criterion to be applied to different types of theories, those having been around since time immemorial and others of more recent origin. The acceptance of our commonsense conceptual framework for mental phenomena as an empirical theory rests on the construal of our everyday psychological terms as theoretical concepts; because the terms of folk psychology gain their meaning, like any theoretical term, from the linguistic network in which they figure, then our familiar mentalistic system is itself a full-blown theory. While it may seem odd, initially at least, to call our common idiom a theory since it is inherited as part of our cultural lore rather than deliberately invented, as is the way with scientific theories, folk psychology is well-endowed with all the characteristics of an empirical theory and should be assessed as such.⁶

The claim that our commonsense view of human behaviour is a theory is strengthened by the structural parallels found between the conceptual apparatus and law-like generalities of folk psychology and those of other theories. That the structural configuration of folk psychology closely resembles that of other theories is evidenced by its similarity to mathematical physics, a paradigm case of theory formulation. The divergence between them is this: whereas the abstract entities of the latter are numbers those of the former are propositions. But their place in the conceptual networks are the same. In physics the 'numerical attitudes' ('...has a mass of n', '...has a velocity of n', '...has a temperature of n') are predicate forming. When 'n' is replaced by a number, a definite predicate is cast. The relations between the 'numerical attitudes' are those of the numbers contained in the attitudes. Further, the indicator term ('n') is responsive to quantification. Thus, we may arrive at generalizations about the relations between numerical attitudes since such laws permit quantification over numbers and they profit from the mathematical relations between numbers. So,

$(x)(f)(m) [(x \text{ has a mass of } m) \ \& \ (x \text{ suffers a net force of } f) \ \rightarrow \ (x \text{ accelerates at } f/m)]$.

A similar pattern is to be found in folk psychology where the propositional attitudes ('...believes that p', '...desires that p', and so on) are also predicate forming. When 'p' is replaced by a proposition, a definite predicate is formed. The relations between the propositional attitudes are those of the propositions contained in the attitudes. Furthermore, the indicator term ('p') may be quantified. Accordingly, law-like

expressions may be generated between propositional attitudes since such generalizations quantify over propositions and make use of the logical relations between propositions. So

$$(x)(p) [(x \text{ fears that } p) \rightarrow (x \text{ desires that } \sim p)].^7$$

In our everyday lives we explain and predict behaviour by reference to the beliefs, desires and other psychological states which are presumed to have an influential bearing on such conduct. The conceptual structure of folk psychology consists of two relatively broad classes of entities: there are the 'intentional' concepts, such as belief and desire, which convey propositional attitudes and about which we will be primarily concerned; and then there are the 'non-intentional' concepts which designate such mental states as happiness and pain in the domains of emotional and bodily sensations. The following list of general principles express regularities of a sort with which most of us are familiar since they are constitutive of our commonsense theory of human behaviour.

- (1) People who suffer severe bodily damage will feel pain.
- (2) People denied fluids tend to feel thirsty.
- (3) People in pain want to relieve the pain.
- (4) People who believe that p, where p entails that q, tend to believe q.
- (5) People subjected to a sharp sudden pain tend to wince and/or cry out.
- (6) People who believe that p usually assent to p when queried.⁸

Now, (1) and (2) apply to inner effects of external circumstances, (3) and (4) state regularities between mental states, and (5) and (6) point to mental determinants of overt behaviour.

The non-intentional principles (1, 2, 3 & 5) express causal regularities - they enable us to explain behaviour and predict future conduct. Such generalizations of folk psychology, taken in their hundreds if not thousands, forming the bulk of our commonsense view, are clearly both causal and nomological in character.

The intentional generalizations (4 & 6), on the other hand, evince *intentionality*; that is, they 'intend' something beyond themselves, namely, propositions. Such generalizations, which dominate our folk-psychological theory since they comprise the core of human consciousness, express propositional attitudes because each exhibits a specific attitude towards a particular proposition (believe that p, hope that p).⁹ Propositional attitudes require a proposition specifying the content to which some

attitude is formed; thus, if X believes that p, then the proposition p identifies the content of X's belief. When the singular propositional attitudes are taken as a mass, the logical relations between them are established by the logical relations between the propositions. The connection between beliefs, or between beliefs and desires, will be determined by the linkages of the propositional content, and where a universal relation holds between two propositional attitudes, we can state laws - if X strongly wants p then X hopes that q (X wants A to win and hopes that A is in better form than B). Therefore, abstract relations are invoked to enable us to explain both the empirical regularities of observed behaviour, the connections between various mental states and the linkage of mental states to behaviour.

Even though, within folk psychology, the intentional and non-intentional can be separated out, the question of their relation remains. The non-intentional component, composed of empirical/causal elements, forms the greater part of the theory and carries considerable explanatory weight. The rather more complicated intentional element, embedded in this nomological milieu, is itself both empirical and causal, and for two reasons. First, such generalizations as the propositional attitudes afford can be employed to successfully predict other people's behaviour. If I have information that X, when in a cognitive state A does B, then I can predict with a fair degree of success that on future occasions of X being in cognitive state A that X will do B. But, and this is the crucial point, any generalization that permits the prediction of one empirical state from another empirical state must itself be empirical in nature. Second, other people's behaviour can be controlled by manipulating the antecedent determinants of their cognitive states. If X's particular behaviour (B) is held to be undesirable then a change of behaviour ($\sim B$) can be brought about by ensuring that X does not enter cognitive state A. This could be achieved by making information available, or withholding it, so that X's cognitive condition is steered away from A. Clearly, this is simply not possible unless there is a grasp of the causal chain of empirical regularities linking external conditions, inner states and external behaviour. In short, folk psychology is a *theory* about human behaviour: our ability to explain, predict and control our own and other people's behaviour rests on our command of the generalizations of the theory which, if they are to do the work expected of them, must be both empirical and causal.

Folk psychology is not without merit. It stands as a remarkable accomplishment

in human intellectual activity, providing a clear and systematic account of the verbal and non-verbal behaviour of one of the most complex of animals, and to date remains largely unrivalled by any serious theoretical alternative, at least in the public sphere.¹⁰ One of its major strengths lies in the unity it brings to our explanations of human conduct - in the philosophy of mind it provides a coherent theory of other minds, one's own mental states and the mind/body relation. The problem of other minds affords the simplest entering point: that another person has certain mental states is arrived at neither inductively from the singular instance of one's own mind nor deductively from the observed behaviour of others. Rather, the assumption that others have minds akin to one's own rests on the theoretical hypothesis that their behaviour is explicable only if minds are posited. This is a perfectly straightforward and scientifically respectable strategy if people's on-going behaviour is to be explained and predicted, and it is plausible as a theory so long as it is successful in explaining and predicting. That it is successful strengthens the conviction that others have internal states similar to one's own.

Whereas the positing of other minds is founded on both a theoretical conjecture and the vast accumulation of observed regularities of behaviour which jointly appear to give support to it, the matter of introspecting one's own inner states seems to rest on slim foundations indeed. If consistency with other minds is to be preserved, then one's introspection of one's own mental states is no straightforward affair. We do not read off our cognitive states just as they really are in their innermost nature, as if they are made immediately plain to us through direct experience.¹¹ On the contrary, whatever knowledge the mind might have of itself is mediated by a network of theoretical concepts. Our conceptual grasp of things, both inner and outer, is the same. We learn to conceptualize by acquiring words by which to refer to things. Learning the word 'table' requires learning generalizations about tables; the ability to discriminate between tables and chairs is developed with practice and such discriminations are usually both useful to make and are those made by more experienced users of the language. So too with our inner psychological workings. We learn such words as 'is angry' by mastering generalizations about anger - that being attacked can provoke anger, or that being deprived of something can lead to anger, or that name-calling can lead to anger, and so on. And likewise for the other expressions of folk psychology. Further, our competence

in discriminating between different introspective states is picked up and refined through experience in the company of others who make comparable judgements. The upshot is this: our similarity standards remain the same, but, if our conceptual network for psychological states should be less than at present our ability to introspect our inner frame of mind would be reduced and if our framework should be more than our introspective apprehension would be enhanced beyond what it is now. If the above argument is correct then it follows that introspection is but a species of observational judgement: each of us acquires our conceptual structure required for discerning our inner world in exactly the same fashion as we attain that for apprehending the external world. We learn from birth the language of discrimination, refining and extending as we go.

What this rules out is the possession of some special atheoretical mechanism which gives us access to our own inner states. While we do have privileged access to our own inner states in a way that others do not have access to them since they are ours and are thus not introspectively available to others, this does not mean that each one of us has an extraordinary faculty which gives us direct, unmediated entry to our inner states about which we have infallible knowledge. Our inner and outer worlds are understood in exactly the same manner - by way of our conceptual scheme which we bring to bear on our experience.

If our introspective judgements of our own mental states are mediated by our theoretical network, then the question arises as to whether such judgements are, as sometimes claimed, infallible. Well, clearly enough, we can be mistaken, sometimes profoundly so, in our awareness of our beliefs, desires, and so on. Psycho-analysis and phantom limbs bear witness to this. But if infallibility is restricted to cover no more than a limited part of our self-understanding then there appears to be no satisfactory account of how these infallible introspections differ from their fallible brethren which would warrant their protected status. We are thus inexorably driven to the conclusion that no judgement, whether of inner or outer affairs, is immune from revision. With any and all judgements, we could be in error. If this is the case, as it seems to be, then the argument for special access providing infallible knowledge of our inner states seems a difficult one to sustain.

As for the mind/body conundrum, the upshot of seeing it in a theoretical way is

one of determining how the ontology of folk psychology relates to the ontology of a completed neuroscience and whether the former is reducible to the latter or is to be eliminated by it.

The corollary of the argument is this: regardless of how useful our folk psychological theory might be, there is always the very real possibility that, as a theory, it is false. That is, there might be no such things as mental states so our introspective judgements and attribution of mental states to others could be systematically in error. It follows, then, that if our folk psychology is inadequate to the task of explaining then we may need to learn a different and more adequate conceptual framework if our own and other people's inner states are to be apprehended.

Although folk psychology is not without its successes, and a good many at that, the advantages of treating it as a theory (or a bundle of related theories) lies in assessing its validity or truth in accordance with the criteria against which theories are usually appraised. This permits questions to be put: how it has developed, or failed to develop; whether it has any explanatory failures and just how serious these are; whether it has the potential for further development; how it relates to other theories; and whether it might reduce to or be eliminated by another theory.¹² Addressing these questions brings together a body of evidence against folk psychology which until now has been rather scattered, so having little impact on the target. Since we are dealing with a wide-ranging theory then the matter of its falsity will be decided not by any one contrary argument but by the combined efforts of as many counter arguments, taken as a whole, as can be mustered. None is more compelling than a better rival theory.

Folk psychology, in one form or another, has been around for two thousand years or more, yet in that time little development has occurred. It has been widely used in most if not all human societies from at least as far back as the ancient Greeks: indeed, our folk psychology of today employs much the same conceptual framework of intention and desire to explain and predict human behaviour as that used by Hippocrates, Plato and Sophocles. Unless they were it completely right in the first place, this is an inordinately long period of theoretical stagnation and infertility in the face of accumulated anomalies and unexplained puzzles; of course, it is always possible to claim that the ancients were right, but the fate of our past folk theories in astronomy, biology, chemistry and physics, inductively, leaves us with little confidence in the truth of

folk psychology. While not a compelling argument in its own right, it does raise the issue of how they could be right on such a complex matter as human consciousness when they were so far off the mark with their theorizing about less complicated phenomena.¹³

Folk psychology works exceedingly well so long as its sphere of application is limited to a narrowly-defined humdrum part of human behaviour, that which we call normal. But even here the poverty of folk psychology is abundantly apparent: we have very little understanding of what sleep is, how it relates to mental processes, and why we need it, even though we spend on average a third of each day in this state; associated with sleep is the vexed problem of dreams; in our waking hours such intellectual processes as practical and factual reasoning are poorly grasped; the dynamics of our emotions are extremely vague; our capacity for creative imagination is beyond present explanation; the nature of intelligence and the reasons for intellectual differences between individuals remains clouded; the remarkable faculty of memory, being the ability to retrieve stored information in an instant, continues to mystify us; the vicissitudes of perception and perceptual illusion still stump us; and finally, but importantly for educators, we simply have no idea of the nature of the learning process itself, in particular how language is learned, and how growing and learning are connected. And beyond normal behaviour there is no evidence to suggest that folk psychology is any closer to explaining either the nature and causes of mental illness or the puzzling behavioural and cognitive deficiencies exhibited by those suffering brain damage. As for the extra-ordinary feats (mathematical calculations, musical ability, etc) performed by otherwise below normal people, folk psychology is deafeningly silent. In short, there is much about ourselves that we just do not understand, and folk psychology has to date simply failed to fill the widening gaps.¹⁴ A stalled theory may warrant extended protection and allegiance if, for example, it is the only one available, or if it amongst its rivals best coheres with related theory, or if it shows promise of reducing another theory or being reduced itself. But none of these hold for folk psychology.

Whether folk psychology can repair these defects depends very much on its potential for further development. In its present state there seems little scope for it to extend much beyond its already well-utilized resources. Three variations - dualism, identity theory, and functionalism - all preserve the basic character of folk psychology.

This conserving of the conceptual framework and fundamental laws is not without some merit where it can be achieved, since folk psychology does have its explanatory and predictive successes, but since folk psychology in its various guises is an empirical theory, it could turn out that in the long run it may not survive the challenge of a rival theory rooted in the sciences. Whether this happens will ultimately depend on the co-evolution of folk psychology and its rivals.¹⁵

One mark of a good theory is its connections to other theories with which it may be assumed to relate; that is, whether it coheres with its surrounding theory or is incommensurable with it. Considered as physical entities, humans are quite properly the subject of explanatory theories about their genesis, development, composition and behaviour, couched in terms drawn from such neighbouring conceptual systems as particle physics, atomic and molecular theory, organic chemistry, evolutionary theory, biology, physiology and neuroscience. The account we give of humans in materialist terms is continuous with the rest of our scientific enterprise, contributing to an increasingly coherent synthesis of the natural world. However, with folk psychology the matter is very different, being one of incompatibility.

What distinguishes folk psychological theory from the corpus of scientific theory is its use of propositional attitudes. Whereas the rest of our physical theory provides causal accounts of the relations between physical states, folk psychology, by contrast, in dealing with the content sentences of propositional attitudes, provides an account of the logical relations which can be performed on the content sentences.¹⁶ In short, folk psychology is sentential: on this model, the mind is conceived of as a sentential computing device, taking sentences at the input level, performing logical relations on them (induction, deduction, implication, contradiction, etc), and producing other sentences at the output level. The point of contention is this: does the brain, as an information processor, process information sententially as folk psychology would have it, or does it process information primarily in a non-linguistic mode?

There are a number of reasons why the sentential model of cognitive activity is less than plausible, some more compelling than others. First, given that humans are members of the class of animals, then there is an unexplained discontinuity in the accounts offered of cognitive information processing in the brains of man and beast. Evolutionary theory, at the very least, would suggest a neurological process of learning,

perception and representation, graded by degrees of sophistication rather than cleaved by differences in kind. At best, human information processing is no more than a special case of information processing found generally in all animals. The conjecture that human cognition is the outcome of some emergent property supervening on the physical is nothing but a desperate attempt to rescue the notion of humans as somehow hived off from their fellow creatures. Second, a sentential story is unable to explain learning in non-human animals, pre-linguistic children, deaf mutes and the like. The sentential resources of folk psychology are quite incapable of accounting for non-sentential cognitive activity. Third, the notion that the sentential structure of folk psychology provides an exemplar for intellectual activity is misplaced. What makes for intellectual behaviour is not the capacity to manipulate sentences but to solve problems. So, sententially capable humans often act in unintelligent ways whilst non-linguistic humans and animals are quite capable of behaving in ways which we find no difficulty in labeling intelligent. Fourth, if the sentential model is seriously taken to represent ideal rationality, then there is a very real problem of its accounting for the deep structure of cognition. Language is learned, in a social context in the company of other competent language users, so it is evident that the content sentences of propositional attitudes are, over a lengthy time, also learned. Yet such learning is done by the brain which is capable of a great many other operations preceding language acquisition. If language is only one form of information input, and for the child a later one at that, why should it be supposed that information processing should be modelled on language use when prior to or without language humans are quite capable of complex non-linguistic cognitive functioning of a clearly rational sort? What language does provide is a superior mode of learning. The conclusion to be drawn is this: humans, possessing brains, are highly sophisticated information processors. Some of this processing is clearly non-sentential, the basic workings of our sensory mechanisms fall into this category. It makes no sense to describe these in terms of logical operations on sentential attitudes. On the other hand, it may be conceded that a small part of our processing involves sentences - after all, we are able to talk and listen, sometimes even silently to ourselves, but here language is being used primarily to communicate. But this is a concession of no great import since such processing is at a rather superficial level. And between these two there is much cognitive processing the nature of which is both highly complex and

still inexplicable. Unfortunately, folk psychology does not have the resources to make good our ignorance. What all this means is that the differences between our static commonsense conceptual framework for persons and our ever-expanding conceptual framework for the rest of nature are such that folk psychology stands in splendid isolation from the bulk of our science and it is problematic whether the common idiom could ever be made conceptually continuous with it. In short, folk psychology fails to cohere with neighbouring well-established and productive scientific theories, and in the absence of any possibility of doing so, the future of folk psychology must be seriously questioned.¹⁷

The question, then, of just how good a theory folk psychology is, is an empirical, not an a priori or conceptual, question. Since folk psychology is a theory, and an empirical one at that, its adequacy as a theory is assessable according to the criteria governing theory appraisal. And this means determining its potential for successful reduction to or outright elimination by a rival theory. The fate of folk psychology rests very much on how it compares with the virtues of any rival theory. Whether it will stubbornly resist coherence, or is reduced or eliminated as yet remains indeterminate. There is no utterly compelling evidence for concluding that folk psychology will be successfully reduced to a rival theory, nor are there decisive grounds for assuming its wholesale elimination. All that can be said at this point is this: there are a range of possibilities and any prediction of a future outcome must remain little more than a bold conjecture. A successful overall reduction cannot be ruled out; even the occasional partial reduction may be possible, and if so all to the good, but in the light of the available evidence of a modestly compelling sort, the chances are that, like its fellow folk theories, commonsense psychology will eventually be replaced by an empirical theory consistent with the rest of science.

But the shift from folk psychology to empirical science is no straightforward transition.¹⁸ First, there is no question of dispensing with commonsense until a better theory is available, and at present there is no full-blown viable alternative. Until a competing theory is sufficiently developed, we must continue to use the best theory we have available to us, however flawed or false it might be. So, folk psychology is probably not in any immediate danger of being replaced. Second, the shift, if and when it comes, may require a lengthy period in which folk psychology and its empirical rival co-evolve

before either reduction or elimination is achieved. It may well be that the process of evolution unfolds in such a way that the psychology which is reduced bears little similarity to folk psychology as we presently know it. Rather than folk psychology fronting up directly to the challenge of empirical science, it is quite possible that current folk psychology will evolve into a quite different psychology, perhaps physiological psychology, the generalizations of which in turn may eventually reduce to those of a completed neuroscience. In which case, folk psychology will be effectively eliminated rather than smoothly reduced. Third, any move away from folk psychology to an alternative theory is, sociologically, a long-term process, perhaps encompassing generations and spanning at least a century or more. At the social level, the infusion of scientific concepts and expressions into daily discourse will come through a slow evolution of changing language use, making progress here and there as opportunity permits. The incremental advance, rather than wholesale revision, of science over folk psychology is thus no more than the standard pattern of the replacement of folk theory by new scientific theory. At the individual level, however, rapid advances can be expected as scientific theory progresses and is seen to supersede our everyday conceptions. Education has a fundamental role to play in this process. Fourth, the longevity of folk psychology carries with it a misplaced assumption that the common idiom provides the standard or touchstone against which 'the facts' are to be explained. That folk psychology is so widely accepted, and has been for so long, is one thing; to demand that alternative theories be constrained by both 'the empirical facts' and 'the theoretical terms' as folk psychology perceives them is another matter altogether. With any reduction or elimination, it is unlikely that the conceptual categories of folk psychology will be straightforwardly translated across to the reducing or eliminating theory. Progress may even require total overthrow of the old and a comprehensive introduction to the new, coupled with the need to overcome the stubborn resistance of those who accord folk psychology a significance beyond its warrant. After all, folk psychology is deeply entrenched in our psyche, and any alternative account is accorded a low level of plausibility.

The alternative philosophical position being advanced is eliminative materialism, the central claim of which is that folk psychology, being both inadequate and false, will eventually be replaced by rather than smoothly reducing to a completed neuroscience

which has far greater resources to explain and predict human behaviour. In short, folk psychology will be *eliminated* by a *materialist* theory of neuropsychology. Our understanding of others and ourselves will be re-established within a mature neuropsychological theory which is not only more empirically wide-ranging and theoretically powerful than folk psychology, but unlike it, is also in harmony with the rest of physical science.

Although a fully developed empirical theory capable of reducing or eliminating folk psychology is not yet available nor are its central features more than dimly perceived, it is not unreasonable to support and promote an embryonic theory which has so far proved to be both fertile and coherent with the corpus of physical science, the theories of which are immensely robust and systematically organized. In the long-run neuroscience may turn out to be the very best theory (or set of theories) on offer. But, before considering whether elimination is possible or even likely, something needs to be said about the replacing theory, albeit of a tentative nature.

We have, as Quine¹⁹ suggests, three levels of explanation - the mental, the behavioural, and the physiological. At the level of the mental, folk psychology invokes propositional attitudes and the other mental states to explain human behaviour. This is, as earlier noted, a rather superficial and almost non-explanatory account facing either reduction or elimination. The behavioural level, on the other hand, consists of those explicit linguistic and non-linguistic behaviours which we observe performed by others and ourselves. Implicit in our speech and bodily activity are dispositions to function in these multifarious ways. Although it is with the behavioural that we often must settle, for the moment at least, the appeal to dispositions in our explanations directs our attention to the third, and most complex, the physiological, where the notion of disposition²⁰ stands as proxy to as yet unidentified causal mechanisms.

Dispositions are enduring, structural traits, innate or learned, acquired either genetically through intergenerational transmission of chromosomic matter or culturally through intergenerational transmission of social practices. Either way, a disposition is a neural condition which prompts a person to behave, linguistically or otherwise, on a particular occasion; as such, a disposition may operate singularly or in tandem with others, their conjunction being complex behaviour. Some dispositions carry with them a name by which they are identified, such as 'intelligence', but others do

not. And a name for a particular disposition takes its place in the vocabulary of scientific theory as a term for a specific causal mechanism whether identified or not. Such is the case with the term 'intelligence'. After all, we do not restrict our theoretical vocabulary just to those things we understand completely. However, named or not, each one of us possesses such neural properties as dispose us to behave in this way or that. Dispositions, then, have behavioural manifestations and are identified by these. The character of dispositions can best be illustrated by reference to the dispositional term 'soluble'. For a lump of matter, say sugar, to be soluble it must, if placed in water, dissolve. Talk of sugar being soluble is to postulate that sugar is in some way disposed to dissolve, that it possesses such properties as permit its dissolving. At one time the term 'solubility' stood as a promissory note for the future discovery of some causal explanation of why sugar dissolves. Advances in chemical theory in due course redeemed the solubility notion within a comprehensive theory of chemical structure and composition. Now, solubility is understood within a causal theory of the arrangement and movement of molecules and other smaller particles; it is the microscopic composition of particular solids which provides the causal mechanism for solubility to occur. Thus, sugar dissolves in water because it has the microscopic properties; steel, lacking such properties, does not. While serving in its capacity as a promissory note prior to the elucidation of a scientific account of a working mechanism, 'solubility' stood in place of, and was acknowledged as a proxy for, empirical explanations of a physical process. And we continued to employ the term 'soluble' to refer to just those occasions when a lump of sugar dissolved in water, even though the structural traits of sugar were not understood. And likewise for other dispositional terms such as 'fragile' and 'expand', some of which have to date gathered an explicit theoretical explanation of structure and substance, and others not. But, whereas in many cases scientists have been able to redeem the dispositional traits of physical matter, this is not so with the bulk of the dispositions underlying our linguistic and bodily behaviour. Solubility is the capacity to dissolve in water and chemists have discovered the causal mechanism; intelligence is the capacity to learn, or solve problems, with the term 'intelligence' serving as a promissory note for causal mechanisms not yet discovered.²¹ However, once made respectable by redemption, dispositional terms, at least in science if not in the common idiom, become superfluous. Thus, in an ideal language for a completed global theory of

reality, there would be no place for dispositional terms, these having been cashed out as causal explanations; but with developing theory the idiom of dispositions is quite indispensable pending completeness. In developing a theory, dispositional terms provide us with the key features of what will, hopefully, emerge as a plausible causal mechanism. And since scientific theory is always developing, dispositional terms are probably here to stay, even though some of the causal workings will be identified as science progresses.

The physiological level of explanation is the most fundamental insofar as the elucidation of human behaviour is concerned. Such an account encompasses not only the brain, the plasticity of which permits the process of learning and the like, but also brings the cultural milieu within its ambit. The basic principle of materialism is that our cognitive activities and processes are no more than activities and processes of the brain and CNS. An adequate understanding of the nervous system is best gained by investigating the nervous system itself, to discover the structure and composition of the system, how the elements are connected and interact, and how they are linked to behaviour. Thus, we may examine the electrochemical and developmental workings of neurons (impulse-processing brain cells) and neuronal systems and their attachments to muscles, so that we will in due course have a good understanding of human cognitive and non-cognitive behaviour. Such is the explanatory scope of what may well prove to be one of the most ambitious theoretical programmes in science.

The problem for the eliminative materialist is this: how to explain and predict the underlying properties of our sensations and the meaningful content of propositional attitudes in purely physical terms? To be able to do so is a major challenge but progressive research programmes across the spectrum of scientific disciplines are forging ahead with solutions, and it is to these that we must turn.

The focal point is the brain: it is by way of the brain that we understand the brain and its total physical surrounds, both bodily and external. The neurosciences have, through their powerful explanatory resources, thrown up a good deal of information about the brain. To begin, we know that we have brains and we have a fair understanding of their structural arrangements and material composition. Structurally, they consist of neuronal cells organized into systems which are connected to one another, to the sensory nerves attached to the sensory organs, and to the motor nerves

linked to the muscles. About the chemistry of the brain we have grasped how the neurons emit micro-electrochemical pulses along their axons and dendritic fibres, such firings either triggering off or ceasing the firing of other nerve cells. We have come to understand how such activity processes and transmits sensory stimulation, whereby a selection of salient elements are passed on to more complex information-processing units. And we have some comprehension of how neural activity connects to bodily behaviour. On the other hand, neurology has identified an array of connections between various brain impairments and a diversity of behavioural and cognitive defects. Some of these failings are glaringly obvious while others are almost imperceptible without instrumentation, but whichever, the inability to read, or to speak and understand speech, or to recognize faces, or to place information in long-term memory, and so on, are all tied to the damage of very specific and localized sectors of the brain. But trauma is not the only source of information about the brain. The advances of the neurosciences have revealed a great deal about the brain's electrochemical workings, especially those associated with human learning. To date, neuroscience is able to show how much of our behaviour can be explained by the electrical and chemical processes of the brain, and as further advances are made then more of our behaviour will fall under this explanatory umbrella.²²

The first prong of the problem is how to reconceptualize the intrinsic qualities of sensations in physical terms? If our inner states are introspective under the theoretical terms of folk psychology, then they are just as introspective under the descriptors of any theory which may reduce or eliminate folk psychology.²³ Some of our more familiar sensations are readily reconceptualized: the various states which we call 'pain' are better discriminated as stimulations of our A-delta fibres and/or C-delta fibres (peripheral pain) or of our thalamus and/or reticular formation (central pain). The customary sensations of falling and acceleration are no more than distortions and easings of one's vestibular maculae (the tiny jello-like linear accelerometers in the vestibular system). Rotational 'dizziness' is better explained as a residual circulation of the inertial fluid in the semicircular canals of the inner ear. And 'pins and needles' is oxygen deprivation of the nerve endings at a particular bodily site.²⁴ Taken individually, each restatement is relatively insignificant, but taken together as a macro neurophysiological theory, a radically transforming picture of our self-understanding

emerges.

The second prong is more troublesome still: how to reconceptualize the meaningful content of propositional attitudes in physical terms? There is a way. The brain is a device which both processes and facilitates the transmission of information to other brains. One part, perhaps a not very big part and probably peripheral to the brain's operation, permits information to be exchanged through the medium of language. Language is a social art, learned in a social context, and serving the purpose of social communication. Language is representational - it represents the world in sentential form. Sentences have logical connections served by implication while truth, in the Tarskian sense, is a property of sentences. Language, as we know it, as a medium of information exchange, is a late-comer in the repertoire of human communication, and could conceivably be displaced sometime by other non-sentential means of information exchange.²⁵ To be sure, language is the best form of information exchange we presently have, but it is by no means the very best that we could possibly have. Another part of the brain, perhaps a large and central part at that, processes information. The crucial point to be made is this: it is unlikely, given what we know, that the brain, as an information processor, processes sentential information in accordance with the canons of logic. The brain, as an electrochemical apparatus, appears to process information of a non-sentential kind, possibly numerical, in a manner the exact nature of which remains unknown. But what is becoming clear is that there is no reason to suppose that information processing is anything like information exchange. In other words, our cognitive representation of the world may turn out to be nothing like our linguistic representation of the world, even though the linguistic skills we acquire may structure and enable particular cognitive capacities. The brain thus serves as a device for transforming information from the linguistic to the non-linguistic modes, and vice-versa, and, as such, from a sentential to a, as yet unknown, non-sentential form of representation, and their reversal.²⁶ If all of this is so, then our traditional philosophical and commonsense notions of consciousness, thought, learning, knowledge and truth are in line for radical reconceptualization.²⁷ How so remains obscure for there is, as yet, no explanatory theory available. There are suggestive leads and promising findings across the mosaic of inquiry which, collectively, point to the prospect of our eventually coming to understand ourselves in a more sophisticated and systematic way. But we

are not there yet, not even tantalizingly close. However, of one thing we can be sure, the question of how the brain, and ipso facto, how we, cognitively represent the world including ourselves, as distinct from our linguistic representations, is an empirical question waiting an empirical answer. And this, in Quinean terms, is epistemology naturalized at its starkest and boldest.

It was earlier remarked that a materialist account must encompass both the plasticity of the brain and the cultural surrounds. It is now time to consider these in a little more detail. Human consciousness is composed of not only those properties of the brain but also the culturally-embedded matrix of social relations as these bear on other humans, communal practices and public institutions such as educational organizations. A materialist story of human behaviour must therefore admit the plasticity of the brain to explain both individual learning and cultural evolution, which are mutually interdependent - an individual's life-long learning occurs within an ever evolving cultural milieu and the continuing evolution of the culture is driven by the growth of what individuals learn. Insofar as both 'human nature' and culture are endlessly various, then there is no stable or universal human nature or culture which an eliminative materialist could ever explicate. This being so, any satisfactory explanation of human behaviour must be couched in terms of the plasticity of the brain to take into account the variations of human consciousness so well depicted in the vast array of linguistic and non-linguistic behaviours, and the significant extent to which such cultural elements as the ideological, linguistic and artefactual surrounds bear on human consciousness and behaviour. An eliminativist position is quite capable of upholding plasticity in its neural and cultural guises.

The account being advanced is known as connectionism, which stands as a fundamental break with traditional philosophical, psychological and sociological explanations of human behaviour. Taking the brain as the site of representation, human consciousness is shaped by both the connections between brain cells (neurons) and the parallel distributed processing (PDP) of information across neural networks.

Plasticity: The brain is composed of a vast mass of neurons connected in various ways to form neural networks across which information is distributed and processed in simultaneously parallel operations (Figure 1).

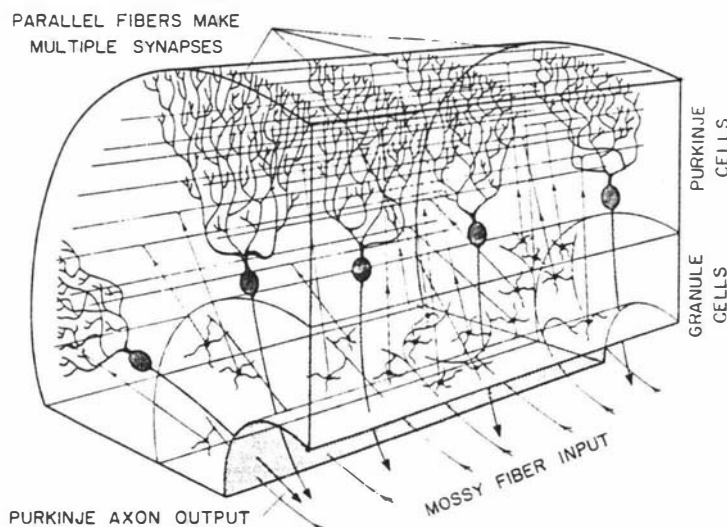


Figure 1: A Schematic Section of the Cerebellum
(Churchland, 1989, 101)

From each neuron there extends an axon, this being a long output fibre with branches at the end which make synaptic connections with other cells either directly or via their dendrites (Figure 2).

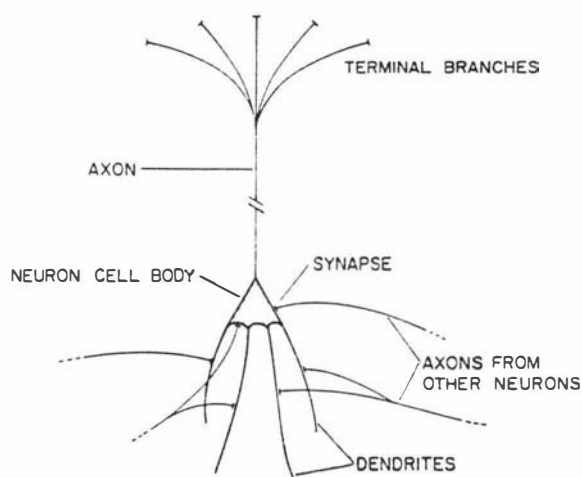


Figure 2: A Schematic Neuron
(Churchland, 1989, 159)

Each neuron receives input stimulation from a great many other neurons, with each individual input either quickening or lessening the normal activity of the neuron, depending on the synaptic connection. The degree of stimulation, either of excitement or inhibition, is determined by the total number of synaptic connections a neuron

possesses, the weight (size) of each connection, the polarity of the charge (arousal or retardation), and the strength of the firing. Each neuron also transmits an outward flow of pulses along its axon, the strength of which is governed by the level of activity in the originating cell. These outward firings (spikings) terminate at the synaptic connections with other neurons.²⁸ Neurons cluster into sets, with one set sending their axons to a second set of neurons, where each axon of the first divides into numerous branches connecting to a great many neurons of the second.

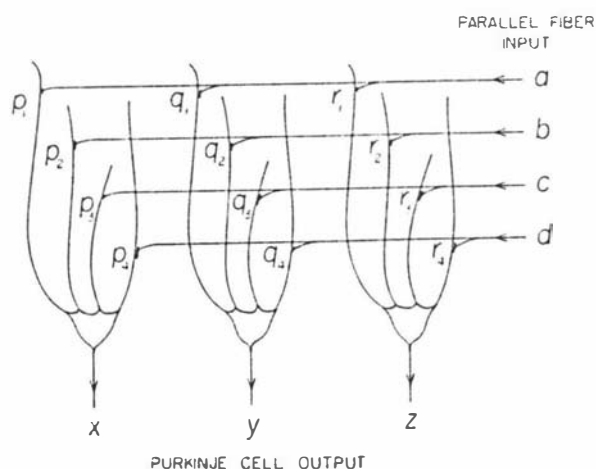


Figure 3: Effecting Vector-to-Vector Transformations with a Neural Net
(Churchland, 1989, 99)

The inputs from a, b, c, and d are distributed in parallel across neurons x, y, and z (Figure 3).

Given that the human brain has around 100 billion (10^{11}) neurons with each neuron having synaptic input from some 3000 (10^3) other neurons, then a human brain will have $10^{11} \times 10^3 = 10^{14}$ synaptic connections. With a total of 10^{14} synaptic weights to utilize, and assuming each weight has a value of between 1-10, the total number of distinct possible configurations of synaptic weights is $10^{14 \cdot 10}$ or $10^{100,000,000,000}$ which amounts to a stupendous set of cognitive arrangements. But this is merely a static computation since brains not only revise up and down the weight accorded a synaptic connection but in the life span of a human brain old neurons die and new ones grow, thereby terminating existing connections and creating millions of new ones. This, then, is the sum total of cognitive resources available in a world populated by an aggregate of 10^{87} elementary particles.²⁹ Since the neural resources far outstrip the referential universe, it is possible to construct any number of cognitive representations, to

conceptualize and categorize the world in an almost infinite number of ways. Such, then, in physiological terms, is the plasticity of the human brain, a plasticity the enormity of which computationally is almost unfathomable. In short, the brain is an information processor of truly awesome dimensions of plasticity.

However, to begin to grasp how the brain represents and processes information requires some appreciation of computer network theory which attempts to model neural activity. A network consists of a set of units; each unit receives input signals from other units via their synaptic connections whose diversity is measured by various weights and polarities. Hence, each unit possesses a level of stimulation which may range, let us say, between 0 and 1 (Figure 4).

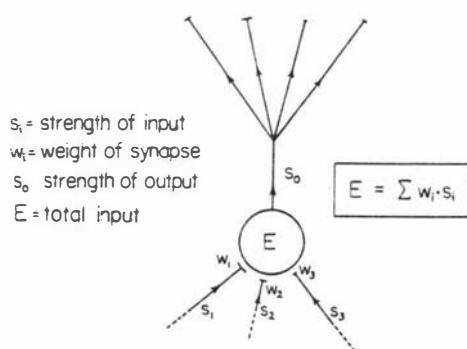


Figure 4: A Neuronlike Processing Unit
(Churchland 1989, 160)

The total input (E) to a unit is the sum (Σ) of the connections, while the contribution of each connection consists of its weight (w_i) times the strength (s_i) of the signal emitted from the originating cell. It follows that if the connection weight is altered then the degree of the target unit's activity will also change, being either excited or inhibited as the case may be. The total input is regulated by the unit which then transmits an output signal of a certain strength (s_o) to an onward unit. The units, taken collectively, constitute a network thus:

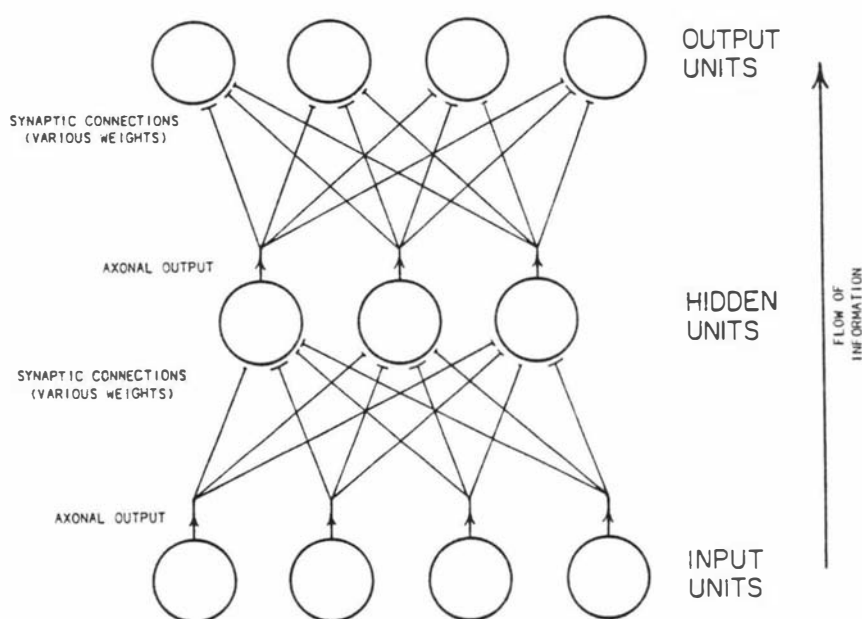


Figure 5: A Simple Network
(Churchland, 1989, 162)

The units at the input level operate as sensory mechanisms since their stimulation is activated by the external environment of physical elements, whether naturally existing or culturally produced. The aggregated stimulation at any given moment is the network's representation of the external or input stimulus - the patterning of the inward signals is the *input vector*, in the case of Figure 5, let us say a numerical set of (0.8, 0.1, 0.5, 0.9).

The inputs are transmitted to the middle stratum of the network which may consist of several layers of units - each input unit makes a synaptic connection of a given weight to every other unit at the intermediary level so that each 'hidden unit' is the target of multiple inputs. The combined activity level of the 'hidden unit' layer is no more than the sum of the stimulation from the input level, and constitutes the '*hidden unit*' vector. The reconstituted information, reduced from a four number vector at the input level to a three number vector at the 'hidden unit' level is then emitted to the output level where a four number *output vector* is generated. The network is thus a mechanism for converting an input vector into an output vector, the whole transformation being determined by the relative values of the different connection weights.³⁰

The processing of information is facilitated by the physical and computational structures of the brain. Because the brain consists of many millions of neurons, this

allows for an enormous number of simple computations to be executed simultaneously. These computations, one per neuron, are performed in the briefest of time and, taken together, their combined output is sufficient to bring about a behavioural response. Unlike the computer, which processes information in serial, squeezing the information single-file through a bottleneck, the brain operates in parallel - the relevant neurons each contribute one firing, and simultaneously constitute one computation. The great advantage of brain processing over computer processing is the former's capacity to engage in extremely complex operations efficiently and almost instantaneously. Witness the remarkable behavioural responses humans are capable of and do demonstrate daily.³¹ The brain, then, is functionally modifiable, and this augers well for future explanations of learning which lie at the core of educational achievement. As yet we do not have an adequate theory of learning. For any theory to be so it must, in physical terms be consistent with what we know about brains, and be able to account for not only the storage of information, but more importantly to explain how new conceptual categories are acquired which permit the entering information to be analyzed and processed. The complexity of the task is apparent when it is realized that such a theory must spell out the learning of a young child and that of the scientific community. In both cases, learning is characterized by the acquisition, development, revision and refutation of conceptual frameworks and their replacement by new categorial structures.

What remains problematic is the way this physical reconceptualization represents. How does the brain represent the external world of objects and our inner world? And what is the relation between these representations and those carried in language? It is even possible that there is no one monolithic system of representation. Rather, there may be various systems corresponding to the different sensory mechanisms. If so, how these cohere in human cognition is unknown. Since our theory of the world is no longer couched in sentential terms, the picture of learning, carrying with it such notions as representation and truth, will bear little or no resemblance to our current descriptions. How the brain represents will not rely on the positing of emergent properties supervening on physical matter; rather, such explanations as may surface will be at the level of physical theories of brain structure and information processing. And as we get a handle on how the brain works, we will have a better grasp of what it is

for a brain to 'theorize', to be 'rational', to 'understand' and to 'know'.³² Until a viable explanation of conceptual change is formulated, the problem of learning will remain unsolved. But of one thing we can be sure: the theory of learning which we may eventually arrive at will, in the spirit of science, be provisional and naturalistic - it should recognize that we, as humans, must regard ourselves as organisms in the world, no different from the rest of the animal kingdom, and our brains are cognitively no different from brains generally. The answer, whatever it is, will only be reached, if at all, by generating theoretical hypotheses and subjecting them to empirical test; it will not come from a priori philosophizing at all.

CULTURAL EMBEDDING

While the plasticity of the brain, particularly the synaptic weights of the neural network, helps determine what entities in the world we represent, which concepts we employ to handle them, the values we profess and the behaviour we exhibit, this is not the end of the story concerning human conduct. We respond to a wide range of cultural entities including language, music, duties and obligations of social arrangements, and so forth. The question is, how does a physical system like the brain cope with these cultural features? That a child, or for that matter anybody, is able to identify and react to cultural properties of our environment is explainable: the neuronal weights of the child's brain are unceasingly influenced by the linguistic and non-linguistic cultural surround. Since our neural network is shaped by the informational input, then the brain represents the nature of that surround in considerable detail. But let it not be thought that the most important elements in the explanation of human behaviour are the cultural artifacts alone which are somehow distinct from physical things. Cultural entities are physical entities, so there is no fundamental difference between them. The cultural may be exceedingly complex, but it is nonetheless material, being part of the furniture of the world. Whatever meanings we may ascribe to these cultural entities, whatever interpretations we might offer of them, whatever theories we might propose about them, our meanings, interpretations and theories are themselves materially constituted even if culturally produced. That our descriptions of cultural phenomena are couched in ordinary language is no barrier to our redescribing them in naturalistic terms, as simple physical elements which stand in a causal relation to both the neural network of our

brains and our behaviour. As with the reduction of folk psychology to neuroscience, so too may we also entertain the intertheoretic reduction of folk cultural theory to some future physical theory.³³ But physicalism gets its bite on the cultural in a second way. Culture is no free-floating domain of mentalistic stuff; rather, culture is a set of behavioural dispositions possessed by individuals and shared by them when in social groups. Such groups obtain their structure by the common behavioural dispositions displayed by the members of the group. That is, the shared dispositions manifest themselves in the social practices of such social groups as educational organizations, to include both verbal and non-verbal activities. Although individuals possess distinct characteristics acquired through their prior learning and experience which reflect their behavioural dispositions, within the various social groups of which they are members the degree of autonomy they enjoy is restrained by the need to utilize those dispositions most conducive to maintaining the organization's social practices. In other words, when the dispositions of the aggregated individuals are co-ordinated in regular and orderly ways in social groups, cultural practices ensue. Which dispositions are activated, and which are not, reflects selections from the set of all possible dispositions; such picking out reveals the relative merits of competing dispositions to determine and achieve goals. The singling out of some dispositions rather than others will be governed by the values of the individual, and of individuals jointly in organizational settings, such values themselves also being materially constituted. Accordingly, insofar as human beings are material entities engaged in material practices in a material environment, then their behavioural dispositions are likewise material; and insofar as culture is a set of dispositions incorporated in the brain/CNS of individuals who corporately constitute organizations, then culture is as material as any other feature of the world.³⁴ The virtue of theorizing culture as material is that such theory coheres with our other theories about the brain, ourselves and the external world. To sheet the point home, Evers has remarked that

...culture is *manifested* by behaviour though *ultimately* explained physically, as the goings on inside people in causal interaction with the world. Since the ultimate explanations of physical science are not in hand, 'behaviour' functions ontologically as a promissory note indicative of deeper causal mechanisms to be located on the agenda of natural

science.³⁵

While a plausible physical theory is not yet available, talk of dispositions stands as a marker pending the formulation of an adequate neurophysiological account of cultural practices.

At least two things follow from this. First, the distinction between reasons for action and causes of behaviour collapses. If reasons are posited to account for actions they must serve in some regulatory capacity in order that the actions occur; in which case, reasons, so called, must stand in some causal relation to actions. If this is so, then reasons are a class of causes. Talk of reasons (including intentions, motives, desires and the like) serves as a promissory note for as yet unexplained material conditions; ordinary descriptions of our actions assume a complex structure of causal regularities in and between human beings and their environmental surrounds, coupled with distinct physical mechanisms which causally connect various components of behaviour. Thus, our explanations of what people do and have done to them are pushed back to psychoneurophysiological laws (or law-like statements) that connect elements of behaviour in like manner that other physical laws link distinctly different material entities. Second, the ontological status of organizations is assured. Whether organizations are real or not, whether there is any advantage to theorizing about organizations in addition to aggregated individuals, are questions to be answered in the affirmative since organizations are constituted by cultural practices and social relations which transcend individuals, taken collectively. It is their interactive relations, generated by shared dispositions, which give organizations their reality.

Finally, will the intertheoretic reduction of folk psychology to neurophysiology be consumed? This is an empirical question and remains completely open, with the answer probably being a long time in coming. In principle, the outright elimination of folk psychology is quite possible; in practice, it remains to be seen. Any reduction is unlikely to be direct; it is highly probable that the process will be one of co-evolution of theories, with folk psychology reducing to scientific psychology, still in its infancy and despite a century of research effort without a comprehensive theory, which in turn may, if all goes well, reduce to neurophysiology, itself in an early state of evolution. Clearly, then, any reduction will only be achieved by some future theories. While some initial theory is required to start the process off, and folk psychology has served this role exceptionally

well, as scientific psychology and neuroscience progressively co-evolve there will be less and less need for folk psychology. And as they evolve, where scientific psychology conflicts with well-established neurophysiological theory, the former must make such revisions as are required to establish theoretical coherence. Even if reduction is not accomplished, then the most powerful theories of psychology, indeed of the social sciences generally, will be those which are consistent with the larger corpus of physical theory. Further, if a successful reduction is achieved, this does not entail the triumph of science over commonsense which carries with it the death of humanism and the banishment of moral responsibility. That there will be a loss is what reduction entails, but it will be the loss of our commonsense way of looking at ourselves and our organizations, not the loss of our humanity. The adoption of a superior theory may even enhance our self-understanding by doing away with traditional concepts which we have come to see as inhumane: indeed, as Churchland has pointed out,

The magnitude of the conceptual revolution here suggested should not be minimized: it would be enormous. And the benefits to humanity might be equally great. If each of us possessed an accurate neuroscientific understanding of...the varieties and causes of mental illness, the factors involved in learning, the neural basis of emotions, intelligence and socialization, then the sum total of human misery might be reduced.³⁶

If Churchland is right, apart from truth, what better reason could there be for the programme of eliminative materialism?

The success of eliminative materialism, while radically altering the way we conceptualize ourselves as human beings, would nonetheless leave some things intact. For example, while we might jettison much of the language we use to convey our emotions and values, employing other terms instead, what is not eliminated are the sensations we call emotions and the dispositions we call values. However much we may alter our theoretical vocabulary on these matters, we will still continue to experience emotional responses and evaluate things. Now, while emotions may not be of central importance to administration and inquiry, it is hard to see how values can be ignored by both fields. On the contrary, axiological considerations would seem to occupy a pivotal role in our conceptual network which both administration and research would need to take account of. Consistent with the rest of the naturalist programme, a

naturalizing of values must be sought. This is the task of the next chapter.

NOTES

- 1 Churchland, 1979, 81-2. There are two Churchlands - Paul and Patricia. Where both are listed in a note, Paul is cited first. Where only one author is cited, identity can be established by reference to the Bibliography.

- 2 In this third case, reduction is possible although more difficult to achieve. To could be reduced to Tn via To* and Tn* where the resources of To* and Tn* are more closely parallel than those of To and Tn. Clearly, because of the revision of To and Tn to* and Tn*, the resulting parallels or matching up of terms may be less than perfect (Churchland, 1979, 84).

- 3 Churchland, 1986, 284-6.

- 4 Churchland, 1979, 86-7; Churchland, 1982, 1042; 1986, 279-80. Some critics of eliminative materialism mistakenly attribute to it a feature it does not possess nor do its adherents claim it possesses. Folk psychologists such as Double and materialists of a non-eliminative sort, including Foss, think that eliminative materialism eliminates not only the theory of folk psychology but also what such a theory denotes. Double (1986, 215) remarks that "learning more about microstructure does not make the first person experience go away." The individual's experience is not eliminated for internal physical states will remain; what 'learning more about microstructure' will eliminate are the first person accounts of this experience using the descriptions and explanations of folk psychology. And according to Foss (1985, 129) "eliminative materialism is on a par with claiming the sun, moon, planets and diseases themselves are just as unreal as spheres and demons...Sleep is a folk psychological concept - is there no such thing as sleep." Here, Foss confuses the ontological with the epistemological. What eliminative materialism seeks to eliminate is the theoretical account provided by folk psychology and replace it with a neuropsychological theory. What experiences both theories refer to remains unchanged although our conceptions of it, whatever the *it* may be, may be radically revised. Churchland (1986, 218) puts the point succinctly enough: "The eliminative option is not concerned to eliminate any real *phenomena*...When and if cognitive theory decides that there are no such things as intentional states, it need not deny that there is something there to be apprehended or cognitively processed - cortical states perhaps. It need only insist...that whatever there is, it isn't *intentional* states, but something else." What goes for intentional states also applies to sleep - we might one day dispense with the term 'sleep' but this will not result in our dispensing with sleep. And it is absurd to think that eliminative materialism holds the objects we call the sun, moon and the planets to be unreal. They are real enough, even if their reality is given us in our theories.

- 5 Churchland, 1985a, 9-14; Churchland, 1986, 282-4.

6 Eliminate materialists take folk psychology to be a theory, and an explanatory one at that. However, critics wedded to folk psychology are divided on the matter. There are some who agree with the eliminativists that folk psychology is a theory. Braaten (1988, 252-3) assumes that we require some kind of theory of human behaviour if we are to understand what is going on in our social world and to be able to interact socially. Folk psychology seems to be the empirical theory most commonly used to describe, explain, and predict human behaviour. Double (1986, 211) recognizes that folk psychology "takes intentional states to explain behaviour" which seems to be a positive consideration in support of the claim that folk psychology is an empirical theory, a view echoed by Horgan and Woodward (1990, 399) who state "folk psychology is a network of principles which constitute a sort of commonsense theory about how to explain human behaviour." Finally, Jackson and Pettit (1990, 33) remark, "eliminativists emphasize that folk psychology is a *theory*. We agree entirely." Others disagree. Bogdan (1988, 371) rejects the idea that folk psychology is a theory on the grounds that commonsense psychology is a practice, not a theory. It does not describe cognition, so cannot be judged true or false. Rather, folk psychology enables us to effortlessly and unreflectively navigate our way in the world in a routine way. The problem with this account is that it relies on a distinction between theory and practice which is untenable. Our practice may be effortless, unreflective and routine, but it is theory-laden nonetheless for it is structured by the goals we set and the procedures we adopt. In short, if no theory then no practice. So Bogdan's claim that folk psychology is not a theory can be rejected. A stronger case is made by Wilkes (1984) in defending the claim that folk psychology is not a theory, but her arguments can be countered, as Preston (1989) has shown. Wilkes' central arguments are these: (1) Whereas scientific theories are primarily concerned with explanation and description, commonsense psychology is not, or at least not primarily so. Whilst it might be agreed that folk psychology serves many more purposes than scientific accounts of cognition, it does not follow that folk psychology is not explanatory. It is to the concepts, generalizations and possibly laws of folk psychology that we appeal to in our everyday descriptions, explanations and predictions of our own and other people's behaviour. That explanation is not the primary function of folk psychology is no argument for denying its explanatory role, so the epistemic difference between scientific theory and folk psychology is one of degree, not of kind. (2) Scientific theories aim at context-transcendence, folk psychology does not. While scientific theories are stated in abstract terms and transcend particular contexts, so too do the generalizations and the laws of folk psychology which Churchland (1989) has identified. But the laws of folk psychology and those of empirical psychology, while context-transcendent, are not free-floating - they are anchored to the situation-specific instances of their application. (3) The vast richness and sheer bulk of our folk psychological language is necessary in everyday life to perform the nondescriptive, nonexplanatory practices we engage in. Science, by contrast, aims at economy and simplicity of vocabulary. All this goes to show is that folk psychology has many more social functions than do scientific theories of human behaviour. But this vast bulk of folk psychology nonetheless rests on a small number of central concepts (belief, desire, etc), generalizations and laws. Science might have a more compact conceptual

superstructure than folk psychology, but both are built upon an economical base of more fundamental concepts and basic laws. (4) An ability to give definitions of the key theoretical terms is an accepted desideratum in science, but with the terms of commonsense psychology their very utility springs precisely from their flexibility and lack of definition. The concepts of folk psychology might escape firm definition but it can be asked whether they are incapable of being so defined. And are they as flexible as Wilkes allows? It would seem not - they might bring many instances under their umbrella but the concepts of folk psychology also admit of fine distinctions, as between actions performed voluntarily, deliberately and on purpose (Preston, 1989, 292). And, as Braaten (1988, 253) has correctly pointed out, "it can be admitted that folk psychology is intended as an empirical theory that provides systematic explanations without assuming that what counts as an explanation in folk psychology would pass as an explanation in the cognitive sciences." (5) Whereas science seeks to identify and describe natural kinds, commonsense psychology does not. Most of the terms of commonsense psychology have no echo in science. While it can be readily admitted that folk psychology does not pick out natural kinds, it should not be assumed that the only things science picks out are natural kinds. While scientific theories typically do deal with them, there are exceptions. It does not seem to be a constraint on theories that they should be required to identify natural kinds - think of the many types of theory that don't. Whether empirical theories must do so is an open question. But insofar as folk psychology is tied to natural kinds such as brains and bodily movements then it is not entirely free from them either. (6) Commonsense psychology is at home with the specific explanations of individual cases of behaviour, but has no concern with generality or systematicity. This is an odd claim. It is not usually the case that two instances of behaviour are so unlike as not to fall under a more general concept or generalization. On the contrary, similar instances of behaviour can be and are grouped and labelled as a class of behaviour. To call an instance of behaviour this or that is to place it under a generalized notion. Further, a person's continuing behaviour usually has recurring instances of a particular kind which can be described, explained and predicted by reference to a more general concept. (7) Commonsense psychology does not indulge in the experimental method typical of the sciences. While science does employ experimentation, this is not a necessary feature of science. Sciences such as astronomy rely on meticulous observations rather than the setting up of experiments. There is no necessary connection between theory and experimentation - scientific theories predated the advent of the experimental method, and do not always rely on it. It is simply irrelevant that folk psychology does not employ experiments. (8) Commonsense psychology is principally concerned with accounting for exceptions to regularities rather than the norm. This objection is very similar to (6) above, and the same response applies. It also appears to be untrue that folk psychology is more concerned with exceptions to the norm since folk psychology lays down regularities in the first place. Exceptions can only be exceptions in relation to norms first established. And even science has an interest in exceptions, or anomalies, to laws and theories. (9) Commonsense psychology is not, as Churchland believes, a 'research programme' which has been stagnant for centuries. In the context of daily life, Wilkes is right to point out that folk

psychology is not a research programme. However, in the narrower confines of the social sciences, folk psychology certainly has all the characteristics of a research programme devoted to explaining human behaviour. Wilkes' objection appears irrelevant to the question of whether folk psychology is a theory since being a research programme is not a necessary feature of theory. (10) Commonsense psychology is not much concerned with truth at all. Much of its apparatus should be construed instrumentally. Many of its terms don't even purport to refer. Oddly enough, Wilkes and Quine (although not an eliminativist but sympathetic to it) are at one on this: Hookway (1988, 67) remarks that "Quine is ready to regard the world revealed by physics as real and to attach instrumental value to those useful features of our familiar scheme which are not vindicated by physics." More importantly, Wilkes' claim is disputed by many ordinary language philosophers who hold that the terms of folk psychology do refer, that there are beliefs, desires and other mental states denoted by these terms, such that the assertions of folk psychology can be assessed to be true or false. In short, not all of those, at least in the social sciences, are committed to the idea that folk psychology possesses no value beyond the instrumental. Given the current dispute among folk psychologists, Wilkes' claim must be set to one side pending resolution. (11) Commonsense psychology does not attempt to emulate the typical virtues of good scientific theories: internal coherence, unifying power, fertility, etc. While folk psychology may not attempt to embody these virtues it is not self evident that folk psychology can avoid them. Folk psychology does possess a degree of internal consistency - it certainly is not racked by massive internal contradictions; there is a measure of simplicity found in the way commonsense explanations can be reduced to beliefs, desires, intentions and the like; philosophically at least, the notion of propositional attitudes provides a unifying concept. (12) The explanations of commonsense psychology aim at the removal of puzzlement *rather than* the discovery of truth. This is just not so. Science also aims at the removal of puzzlement. Furthermore, the removal of puzzlement carries with it the idea that puzzlement can be removed when we know the truth about that which puzzled us. In which case folk psychology is no less concerned with truth than science.

To conclude. Wilkes offers some interesting arguments against the claim that folk psychology is a theory. However, individually and collectively these arguments do not establish her case.

- 7 Churchland, 1981, 70 -1; Lakomski, 1991, 545. It has been claimed by Bogdan (1988, 370-1) that eliminative materialism misrepresents folk psychology on the ground that it misrepresents what cognition is. What is objected to is the way in which the notion of propositional attitudes is presented. But the claim that eliminative materialism misrepresents can be dealt with in two ways, with one argument at least blunting the criticism while the other has stronger force. First, there are critics of eliminative materialism who think that eliminative materialists, or some of them at least, have correctly conceptualized commonsense psychology. Jackson and Pettit (1990, 33), who are supportive of the view that the mental is ineliminable, nonetheless state categorically that "Paul Churchland has provided an excellent, succinct account of the theory." So, there are some folk psychologists who disagree with Bogdan. Second, Bogdan's criticism begs

the question: he claims that eliminative materialism misrepresents cognition, but this assertion rests on the assumption that cognition is as commonsense psychology says it is, in which case the eliminativist account would be mistaken. Bogdan (1988, 371) states his position thus: "the case against eliminativism and for commonsense psychology is going to rest on an argument which takes us *from* a novel characterization of mental information and attitudes *to* the inability of the current formats of scientific explanation to account for them." But the eliminativist case, at the very least, makes the notion of cognition problematic by denying that ordinary language conceptions have got it right; or at the most, eliminativism eliminates the folk psychology account. If anything, Bogdan's charge of misrepresentation is self-referential insofar as he himself misrepresents the eliminativist's representation of cognition. Bogdan thinks that the eliminativist's misrepresentations arise out of the latter's commitment to the maxim that cognition can be described and explained by current scientific theory, and that there are reasons to doubt the axiom's truth. He is both right and wrong. He is right to think that eliminative materialists hold that cognition can and eventually will be fully accounted for by scientific theory: but he is wrong to attribute to them the view that this task can be achieved by current scientific theory. On the contrary, many eliminative materialists (eg. Churchland, 1986) deny that current scientific theory is capable of doing so, but suggest that theoretical co-evolution and theoretical revision and/or reduction will result in an explanatory theory not available to us today. Bogdan's (1988, 376) assertion that "the current constraints on explanation in the sciences of cognition are inevitably going to place strong limitations on the profile of cognition envisaged by eliminativism" doesn't hold water since the constraints upon eliminativism which he sets down are those which arise from within folk psychology, but he assumes two things he is not entitled to: (1) that eliminativism must satisfy these ordinary language constraints when it is possible that a full-blown empirical theory may dissolve these constraints as no longer significant and (2) that ordinary language conceptions of cognition set the standards against which alternative accounts are to be measured and must be incorporated into any reductive story. There is no compelling reason to suppose that ordinary language conceptions of cognition set the standards for cognition at all.

- 8 Churchland, 1979, 92; 1988b, 211. This view is well supported by Foss (1985, 123), Preston (1989, 283-90) and Sharpe (1987, 382).
- 9 There are a host of attitudes one can adopt towards propositions, including believes, knows, desires, wants, hopes, fears, suspects, infers, intends, prefers, and thinks that p. These and other similar predicates form the bulk of our notions about ourselves as persons. Propositional attitudes raise two problems: first, there are the attitudes which are supposedly taken over propositions, such as believing and so on. At issue is whether people believe or not. Second, propositional attitudes may imply attitudes to something, namely, propositions. We may dispense with the objects of propositional attitudes but the attitudes are not so easily cleared away. Quine (1969a) claimed that propositional attitudes present a serious problem since we cannot easily dispense with reference to belief and other attitudes pending an alternative vocabulary not yet available. He

has more recently recognized the significance of philosophical work in neuropsychology as providing a viable replacing theory. Quine (1991,274) writes:

Deeper insights into the nature of scientific inference and explanation may some day be gained in neurology, coupled perhaps with computer simulation, as hinted by the new developments in so-called connectionist models: I think of Paul Churchland.

- 10 Braaten, 1988, 253; Foss, 1985, 122-3. It is not only eliminativists who hold that folk psychology, being a theory, is revisable, There is also some agreement among folk psychologists that this is so. Horgan and Woodward (1990, 400) and Double (1986, 215) accept that there is room for correction and improvement of folk psychology, even on the basis of new developments in neuropsychology and the cognitive sciences. Braaten (1988, 262) accepts the possibility of a radical revision but still insists that even if folk psychology is revised there remains an ineliminable normative component. Since the generalizations and explanations of folk psychology are both descriptive and normative, any revision of folk psychology may amend either or both but will not eliminate them. Braaten's (1988, 264) argument is this: the theory of folk psychology possesses normative content which spells out what counts as normal or acceptable behaviour - "standards of successful co-operation in the pursuit of some worthwhile end; standards that rest upon some measure of progress and regress in human affairs." Explanations of human behaviour consist not only of the behaviour of individuals but of groups of individuals, specially in organizations, where the accounts of organizational behaviour must be compatible with the descriptions of the behaviour of the individuals who are their members, and organizational behaviour provides the context in which the behaviour of individuals is explicable. Because theories of behaviour must take into account the goal-directedness of both individual behaviour and social institutions, these theories must incorporate not only some notion of the ends of behaviour but also some means of distinguishing worthy from unworthy conduct. Hence the need for normative content which folk psychology is able to provide. Accordingly, Braaten thinks that the normative is ineliminable, regardless of the sort of theory we accept to explain human behaviour; while the descriptive terms and categories of folk psychology may be eliminated by a completed neuroscience any such reduction will not dispense with the need for normative considerations. Revision, even radical revision, of our normative folk psychology expressions may occur, but what is not eliminated is the normative content itself. Eliminativists readily concede this, that the normative is necessary, but deny that the normative needs to be couched in the theory of folk psychology. While the normative components of folk psychology are ineliminable, it is, suggests Braaten (1988, 163) "far more difficult to make a case for their irreducibility since this implies the extremely strong claim that they cannot be displaced by more fine-grained revisions to our understanding of mental phenomena from *any* of the sciences (including cognitive psychology) loosely referred to as the cognitive sciences." Since the normative content of folk psychology is revisable but not eliminable, it would be a mistake for eliminative

materialism to dispense with the normative altogether.

- 11 Evers, 1987b, 16. The assumption that we directly introspect our mental states is dubious because the rest of our observations do not conform to this privileged pattern. While our sensory mechanisms permit gross discrimination of bodies, the fine discriminations that we usually make rely on theoretical guidance.

The red surface of an apple does not *look* like a matrix of molecules reflecting photons at certain critical wavelinks, but that is what it is. The sound of a flute does not *sound* like a sinusoidal compression wave train in the atmosphere, but that is what it is. The warmth of the summer air does not *feel* like the mean kinetic energy of millions of tiny molecules, but that is what it is. If one's hopes and pains and beliefs do not *introspectively* seem like electrochemical states in a neural network, that may be only because our faculty of introspection, like our other senses, is not sufficiently penetrating to reveal such hidden details (Churchland, 1988a, 15).

What applies to our sensory observation also applies to our introspection: that our current folk psychology permits a reasonable discrimination between various neural states without the capacity to lay bare their intricate structures.

The question of whether introspection is in some way protected from revision is one which divides folk psychologists and eliminative materialists. There are some folk psychologists, such as Double, who claim that a distinction can be drawn between theoretical and observational grounds for ontological commitment. Double accepts the argument that if the grounds for accepting an entity is that it is posited by a theory to explain our observations, then if the theory is discredited the existence of the posit is denied. This, he thinks, applies to folk physics in its replacement by physical theories, but not to folk psychology. The reason for this is clear enough: the entities of science are those posited by empirical theories whereas those of folk psychology are not theoretical, being immediately apprehended or directly observable. Says Double (1986, 213): "the intentional states of commonsense are not in this category, since they possess an appearance aspect of which we have direct experience." But this argument to quarantine folk psychology off from the rest of our experience rests on an extremely dubious assumption, namely, that we have some faculty or organ which permits us to introspect our own inner states atheoretically. How is this possible? How can we grasp our psychological states of affairs without the help of some conceptual apparatus? The eliminativist response is that this is not possible. Just as the 'appearance aspect' of folk physics, and the like, gave us 'direct experience' of the external world but this did not protect any of our folk psychological posits from elimination in the move to a better theoretical framework when it became available, there is nothing to make us think that intentional states will be immune from revision either when a better theory becomes available to replace folk psychology. In his reply to Double, Churchland (1986, 219) makes it quite clear that "introspection may perhaps assure us of the existence of *something*, but what that something *is* remains always and inevitably a matter of which theoretical framework provides us with the deepest and most useful understanding. This is as true for the introspection of inner states as it is for the perception of outer circumstances." In short, to

reiterate the adage 'all observation is theory-laden', our observations of our inner states which we call introspection, are, like all observations, theory-laden. There is no atheoretical introspection of our inner states for the idea of inner states is itself a theoretical term.

- 12 Churchland, 1982, 1044. Horgan and Woodward (1990) take issue with Churchland's three arguments against folk psychology. (1) To the charge that folk psychology suffers explanatory failure, they are of the view that his claim is at least misleading. First, while they do concede that folk psychology has little to say about the areas of cognition Churchland draws attention to, they point out that theories generated by cognitive psychologists, for example, which do offer explanations of these areas are derived from the concepts of folk psychology. But this argument really serves to underscore the eliminativist point that folk psychology needs to be substantially modified or replaced by more complex theoretical concepts if the hitherto unexplained is to be accounted for. The theories of cognitive psychology to which Horgan and Woodward refer may be derived from the concepts of folk psychology. However, the new concepts are not those of folk psychology, and the new concepts and theories have to some extent been generated as a response to the findings of the neurosciences. Second, Horgan and Woodward claim that Churchland's argument rests on an a priori demand that a successful psychological theory should account for a certain set of phenomena, and to do so in a coherent manner. They counter, "There is no good reason, a priori, to expect that a theory like folk psychology, designed primarily to explain common human actions in terms of beliefs, desires and the like, should also account for phenomena of other kinds" (Horgan and Woodward, 1990, 401-2). This viewpoint begins with the assumption that belief/desire explanations are the most appropriate and then seeks to identify what will fall within its explanatory power. Much is then left out or explained in other ways. The eliminativist begins with the full range of human behaviour and then seeks an explanation to account for the full range. In this sense, eliminativist theories do attempt to explain all that folk psychology explains, and more besides, since the former seeks to account for what the latter takes to be anomalies. (2) To the charge that folk psychology has remained stagnant for centuries, Horgan and Woodward respond that it has changed in significant and empirically progressive ways. An example they give is our more recent willingness to accept that 'unconscious beliefs' have explanatory force in our accounts of human behaviour. But in reply it can be pointed out that the notion of belief is still retained so the advance might not be as great as claimed, and the idea that there might be 'unconscious' entities which play a causal role in human behaviour has less to do with insights generated by folk psychology than it has to the influence of scientific theory, especially those theories propounded by Marx and Freud. Folk psychology can hardly claim to have made these discoveries itself; on the contrary, it had the good sense to adopt the fruits of scientific inquiry. On the matter of stagnation, Horgan and Woodward (1990, 402) offer a second observation, namely, that the standard of 'empirical progressiveness' is not a particularly useful criterion for assessing folk psychology since "the typical user of folk psychology is interested in applying a pre-existing theory to make particular causal judgements about particular instances of human behaviour, not

in formulating new causal generalizations. He is a consumer of causal generalizations, not an inventor of them." In response, it should be noted that even though in the course of daily life we employ the folk physics terms 'sunrise' and 'sunset' to refer to a particular set of events, we nonetheless fall back on modern physical theory to explain the movement of the earth. There is no reason to suppose the matter should be any different with human behaviour where we might continue to employ the expressions of the common idiom in everyday circumstances but then appeal to our best empirical theories available to actually explain our behaviour. Further, while what Horgan and Woodward say may be so for most people going about their daily lives, it does not follow that those engaged in social research are merely applying existing theory. On the contrary, it can be expected that social researchers are inventors, not consumers, of causal generalizations, so should be prepared to go beyond the explanations of folk psychology in the search for adequate causal explanations of the full range of human behaviour. (3) To the charge that folk psychology is irreducible to neuroscience, Horgan and Woodward agree with Churchland's claim but of course they arrive at a conclusion opposite to his. Whereas Churchland holds that the irreducibility leads to elimination Horgan and Woodward think it points to the ineliminability of folk psychology.

- 13 Churchland, 1988a, 46; Churchland, 1982, 1045; 1986, 395-6; Stich, 1983, 229-30. Amongst proponents of folk psychology, there is some divergence on the question of whether commonsense psychology has much to do with truth. Wilkes (1984) thinks not since she takes much of folk psychology to be instrumental. Horgan and Woodward (1990, 400), on the other hand, claim that since the terms of folk psychology actually refer, then what we say about human behaviour in folk psychological expressions can be assessed to be true or false: "Generally our everyday folk psychology descriptions of people are true, and that humans generally do undergo the folk psychology events that we commonly attribute to them." This is where such folk psychologists diverge from eliminativists: the former, such as Horgan and Woodward, claim that the ascriptions of folk psychology refer and are true whereas the latter deny that these ascriptions denote, therefore are false. At least eliminativists appear to be fairly agreed on this matter. Folk psychologists, on the other hand, seem to be divided into instrumentalist and realist camps which are clearly incompatible.
- 14 Braaten, 1988, 253; Churchland, 1979, 114-5; 1981, 73-4; 1988a, 45-6; Churchland, 1982, 1045.
- 15 Churchland, 1979, 13; 1981, 75. The claim that folk psychology will be eliminated by a completed neuropsychological theory is strongly opposed by those committed to commonsense accounts of human behaviour. The arguments against dispensing with folk psychology, either by reduction or elimination, are several. Horgan and Woodward (1990, 399-400) and Foss (1985, 129) claim that eliminativists take the whole of folk psychology to be false, thereby advocating its complete elimination. For folk psychologists, this is completely unacceptable since it would result in the drastic revision of a large portion of our conceptual scheme including a wholesale overhaul of our self-

conception. But for eliminativists it is not an either/or - either folk psychology survives or it is eliminated. Rather, as Churchland (1985, 164) makes abundantly clear, the critics of the eliminativist programme are quite mistaken: "My arguments here, in support of conducting research on the working assumptions that elimination is the destiny of much of folk psychology, do not preclude our being delighted if and when we do stumble across the occasional reductive opportunity. Reduction is always desirable if you can get it. And no doubt some of folk psychology will be successfully reduced." So the objection to elimination that it entails the total rejection of folk psychology misses the target - since it is not what eliminativists claim then the counter-argument fails as an objection to elimination.

A second objection to elimination builds on the reductivist possibilities identified by Churchland. Jackson and Pettit readily agree that parts of folk psychology will reduce to a completed neuroscience. Where they part company with Churchland is over what components of folk psychology will reduce to neuroscience. The former think that a completed neuroscience will contain a large portion of folk psychology, particularly beliefs and desires, whereas the latter holds that it is these central elements of folk psychology which a completed neuroscience will eliminate. Jackson and Pettit paint a particularly complex picture of the reduction: the reduction will transform the information contained in folk psychology into new forms not readily transparent nor easily usable. The reduction may result in information being deeply buried and difficult to extract, but "provided the information is in there, completed neuroscience supersedes folk psychology in the sense of containing it, along with a great deal else, and not in the sense of refuting it" (Jackson and Pettit, 1990, 45-6). However, their argument is not without difficulties. On the basis of conceptual analysis they claim that "completed neuroscience will indeed provide a complete story about when and why we do what we do, but will incorporate rather than eliminate belief and desires in this completed story (Jackson and Pettit, 1990, 51) The first part of their claim is one which eliminativists would entirely agree with; a completed neuroscience will provide the complete story. Of the second part, theirs is a remarkable claim - that armchair conceptual analysis as of now can determine a priori what a future empirical theory, not yet formulated, must necessarily contain. There is no reason to suppose that a completed neuroscience must, conceptually must, have beliefs and desires as part of its content: "To proceed on the assumption that of course folk psychology will reduce, and to make it a requirement on theories of cognitive neurobiology that they address and explain the categorial framework of folk psychology, would be to blinker one's theoretical imagination at the outstart, and to deflect research from the very areas that might set us free. It would make new theories answer not to the facts, but to an already entrenched theory" (Churchland, 1985, 164). The point is that successful theory reduction requires only that the reducing theory explains all that the reduced theory explained, plus more besides, not that the reducing theory must incorporate the conceptual categories of the reduced theory. Yet this is exactly what Jackson and Pettit demand. Their stance runs contrary to both the logic and the history of successful theory reduction and its justification seems problematic, all the more so since they concede that their argument for a commonsense approach to their "folk conception of beliefs and desires shows

that it is *very likely* that they exist" (Jackson and Pettit, 1990, 51). Such an admission is, at the very least, less dogmatic than the conceptual certainty expressed above, being in line with Double's (1986, 215) eminently more warranted conclusion that we must "allow the possibility of learning that a great deal of what we held about our intensional states is wrong." On the question of whether a reducing neuropsychology will contain the categorial framework of a reduced folk psychology, the answer will, in the end, be forthcoming from the continuing practice of theory reduction, not conceptual analysis, and it seems far more reasonable to treat the question as an empirical hypothesis to be tested rather than as an a priori conceptual truth.

One argument against the relatively smooth reduction of folk psychology to a completed neuroscience is this. Folk psychology consists in part, if not completely, of propositional attitudes, but, granting for the moment that there are propositions, their reduction is problematic. This is because propositions are sentential, consisting of a string of words. These are not easily represented as informational bits in a neural network because network information is stored holistically and is widely distributed throughout the system. In the computation processes of the neural network, there will be many variations in input and output calculations and ranges in the synaptic connection strengths. Given this incongruence between propositions and neural computation it is hard to see, firstly, how propositions could ever play a causal role in cognition, and secondly, how propositions could ever be reduced to a neural process. If reduction, smooth or bumpy, is out, then there is not much left but elimination.

- 16 The language of science is extensional because it deals directly with what there is, and fits in well with the logic of objects, properties and things. Folk psychology, on the other hand, is intensional since the terms used do not generally refer to real things but merely identify propositions and our attitudes to them (Lyons, 1990, 252).
- 17 Churchland, 1981, 83; Churchland, 1982, 1045.
- 18 Churchland, 1979, 36 & 44; Churchland, 1982, 1045-7; 1986, 311-2; Quine, 1969b, 334; Stich, 1983, 213-4.
- 19 Quine, 1975b, 87.
- 20 Our talk of people's behaviour is dispositional talk, regardless of whether we utilize the terms 'disposition' and 'disposed' or their similes. Thus, we might substitute 'character', 'make-up', 'nature', 'temperament' and 'tendency' for 'disposition' as in "He is disposed to behave..." And it is from the behaviour of others that we gather our evidence for the imputation of dispositions.
- 21 Quine, 1966, 52-3.
- 22 Churchland, 1988a, 18-9. The fine details of how the brain works need not be considered here. Reference to any good textbook on brain structure and function will provide a satisfactory introduction. For such an account within a

philosophical context, see Churchland (1986).

23 Churchland, 1979, 118.

24 Churchland, 1979, 118-9.

25 The claim that language is a late-comer to the repertoire of information exchange is premised on the assumption that, individually, prelinguistic children are able to communicate, as are those adults who for one reason or another are devoid of linguistic ability. Species-wide, it is reasonable to speculate that primitive homo sapiens were able to communicate amongst themselves in pictorial or behavioural representation prior to their acquisition of language. It is conceivable that future technological advances might lead to the construction of sophisticated devices which permit the exchange of information at the neuronal level from one brain to another without the use of language.

26 In one sense, and a limited one at that, humans may be compared with computers. With a computer, information inputs and outputs can be sentential, but the processing is binary in electrical circuitry. We take in and produce sentences, written and spoken, but the processing is electrochemical. In few other ways is there any similarity between brains and computers.

27 For example, in our linguistic representation, truth, at least in the Tarskian sense employed here, is a property of sentences. But if our cognitive representations are neither linguistic nor sentential then Tarskian truth or any sentential theory of truth will be inappropriate, and a radically new non-sentential conceptualization will be required.

28 Churchland, 1989, 159-60.

29 Churchland, 1989, 190. Whether the totals are exact is immaterial. What matters is the supposed gigantic imbalance between them.

30 Churchland, 1989, 159-63 & 182. The question of how well the network model represents the brain's structure and functioning must be addressed. A complete answer is not yet available since there is still much to learn about the brain, particularly its neural microstructure. Despite its potential value, the network model is inexact in several ways.

Where the model appears to get it right is in the broad structural configuration of the neural states. The neurons are layered and each axon at one level branches out to synaptically connect, according to varying weights, with other cells of a target layer. From the neuroscientific evidence, the account accurately pictures the sensory inputs of the brain, the cerebral cortex and the cerebellum (Figures 1 & 3). A minor difference between the model and the brain (Figure 3) lies in the wiring connections - in the model the end branches synapse directly onto the receiving unit itself while with the brain some connections are made to the dendrites.

But there are major differences which present more difficulty. For a start, with the model a unit at one level connects to all units at the next level whereas

with the brain an axon branches to only a small number of the thousands or millions of neurons in the target layer. Further, neurons in the brain also connect with other neurons at the same level, but this degree of complexity is missing from the model. Whether these two variations turn out to be significant or not depends on what else we might learn about the brain. More serious still, the model requires that a unit have both positive (excitatory) and negative (inhibiting) connections to other units, which may reverse their polarity, if the computer generated network is to successfully function as a model. The brain is more uniform, with the connection polarity being either one or the other, never a mixture nor reversible.

There is a major problem with what Churchland (1989, 184) calls the 'back propagating of apprehended error'. When an output error occurs, there must be (1) a computation of the correction required for each output unit and, by way of these corrections a computation of the corrections required for each unit at the 'hidden unit' and input levels, and (2) some means of causally transmitting these corrections back through the system so that the weights of the relevant synaptic connections are revised up or down. The brain somehow does this very effectively in a manner *internal* to the neural structure, the mechanics of which still eludes us. The model can accommodate both the calculation and the revision of weights, but this is via a computer operating *externally* to the network. How to somehow bring the two into line is the difficult task ahead.

The impact of experience on neural processing cannot be ignored even if the mechanisms remain unknown. What is clear is that as a result of sensory stimulation there are certain effects on the neural system, particularly the synaptic connections and their weightings, which are central to learning. According to Gillett (1989, 270),

What is crucial is that the synaptic connexions between neurons change their properties as a result of experience so that some connexions are favoured and some become less effective. We are not completely sure how this happens but it allows for selectivity of attention and response tuned to multiple interacting constraints in the informational history of the system. Thus the way that networks of neurons transmit information as a result both of innate properties and of experience. The experience could be said to 'weight' the various inputs to which different parts of the system are receptive so that the role of the incoming information is adjusted to fit into and help direct the overall activity of the individual in the light of learning."

Gillett's remarks point in the direction which future research is likely to take in an attempt to identify the ways in which sensory experience impinges on our neural arrangements and the means by which synaptic 'weightings' are influenced by and influence experience.

31 Churchland, 1988a, 121.

32 Churchland, 1986, 265. Assuming, of course, that these expressions would still have a place in a reducing theory of learning. They may not, but in the meantime, in the absence of an alternative theoretical vocabulary, we have no choice but to

continue using existing terms.

- 33 Churchland, 1989, 133-4.
- 34 Walker, 1988, 30-2. Elsewhere, Walker (1991, 517-8) elaborates on culture and human plasticity. The plasticity of human nature which permits such a wide range of behaviours can be explained by underlying physical mechanisms: "The sheer number of neurons and synaptic connections in the brain yield a possible number of configurations well in excess of the total number of elementary particles in the universe. This is more than enough to explain human plasticity."
- 35 Evers, 1989, 79.
- 36 Churchland, 1988a, 45.

CHAPTER TEN

NATURALIZED VALUES AND RESEARCH PRACTICE

Until now, the naturalist project has been a little restrictive in scope, being limited to the more traditional areas of ontology and epistemology. The world was taken to consist of material entities, both observable and unobservable, and classes; the holism of Duhem was expanded, following Quine to encompass the whole of science. The time has now come to consider whether the realm of values, especially moral values, can be incorporated into this scheme.¹ A case will be made for their inclusion: in short, what is aimed for is ontology, epistemology and axiology naturalized.²

A METATHEORY OF VALUE

Values have their origin in our genetic neural structure. At some point after conception brain development occurs, bringing with it the formation of layered cells required for information processing. This massively parallel network of stratified neurons which develops over time operates to recognize perceptual elements in our environment, discriminate between them and promote some over others. At the most basic level, this involves the transmission of sensory stimuli to the peripheral input cells, their forwarding through intermediary layers of neurons, and their reconstituted extrusion from the output units. At the earliest, the absence of intervening neural layers will severely limit the capacity to make sensory discriminations beyond the simplest of surrounding phenomena. Only with neural development and the acquisition of increasing layers of neuronal cells to create a parallel distributed processing network to process information can a near-term foetus or new-born child begin to make more sophisticated discriminations, because such differentiations require both greater amounts of information and more complex computations which only the entire network can provide.

This processing of information, or learning, presupposes the ability to discriminate, and discrimination, at its most primitive, requires what might be called our

'innate bipartite equipment', the exact details of which remain largely unknown.³ Although this neural component is a requirement for learning, it is not itself the result of learning; rather, it is an innate property laid down early in life. So, sometime after conception we acquire our bipartite equipment consisting of epistemic and affective components. On the epistemic side is our similarity element which is cortical: it consists of our similarity standards, so arranged to permit the anticipation that experiences of one kind will be associated with those of another kind. Hence, the primitive ordering of events along the lines of Humean constant conjunction leads to the earliest exercise of induction. On the affective side is our evaluative part, embedded in the limbic system: it consists of our most basic likes and dislikes associated with ordering our sensory experiences along a preference-nonpreference continuum. The epistemic and affective sides are interconnected in the central nervous system and interact thus: although our likes and dislikes initially lack any cognitive content they are nonetheless subject to simple induction, for it is induction which serves as our first guide to what we value. We like what gives us pleasure and dislike that which is unpleasant, with induction serving as the mechanism for recurrence of the former and avoidance of the latter. And conversely, we place value on our inductions as reliable instruments for sensory repetitions and extinctions.

The valuing of things, then, begins with individuated sensory experiences: by way of our similarity standards and inductions we associate certain of these stimuli with pleasant reactions and so in a very primitive sense we come to value them, even though this may be nothing more than physiological stimulus-response. But the acquisition of evaluative concepts begins at an early stage, certainly prelinguistically. The child does not learn such concepts as good, right, fair, ought and so on in abstraction; these concepts are only slowly realized through ongoing and repeated experience, and are built up by the child grasping the various properties of the concepts. However, the distinguishing features of a particular concept are more often than not only frequently present rather than being logically necessary criteria. Those principles having a high level of frequency are prototypical because of their clustering recurrence, and once a child has grasped these prototypical features then an object or a state of affairs is classed as an instance of the concept if its characteristics sufficiently parallel those of the prototype.⁴ The advantage of the prototypicality of our basic concepts lies in their

flexibility, since new cases can be incorporated to fall under the concept while at the same time most of the prototypical features of the concept are retained, so preserving the concepts meaning. Early on, young children begin to classify particular experiences as prototypical moral situations and learn which behavioural responses are typically expected or forbidden. They learn that in certain circumstances one type of behaviour will be positively rewarded and another type will be negatively received. And so, to begin with, a child's preferences and values are expressed behaviourally by either conforming to or dissenting from parental expectations. However, with the acquisition of language comes the opportunity to express these sentiments linguistically. The first evaluative terms to be understood and used consist of little more than simple one-word sentences such as 'good' or 'bad'. They are learned in association with particular objects or behaviours and state of affairs: 'Good' is said in conjunction with a specific sensory experience. With further language learning there is a subsequent move away from direct word/object association as the child is able to connect these earliest expressions to others newly acquired and to utter more complex value statements such as 'Hitting me is wrong' or 'It is not fair to give him more than me'.

With the shift in language use from one-word sentences to more complex linguistic constructions there is a corresponding move away from moral concepts and their verbal expressions being tied to specific sensory experiences; instead, ideas and utterances attain an increasingly more theoretical status. As the link between word and object is weakened and singularly isolated notions give way to their becoming increasingly associated, their meaning becomes less denotational and more dependent on the linguistic context of their use. So, moral language increasingly gains its sense from its place in the linguistic network and the meaning given is very much shaped by the underlying moral theories conveyed by the discourse. Our moral talk becomes firmly entrenched in our conceptual system: at the periphery are our sensory stimulations and simple observation sentences which serve our empirical and affective understanding alike. Further from the periphery the more theoretical the system becomes, and this is so not only for mathematics and physics, but for ethics and aesthetics too. So, moral notions such as good and ought take on a highly theoretical character in exactly the same way as do those of science.

Linguistically, moral and empirical sentences appear to have a similar

epistemological structure and this is not altogether surprising given their common biological and experiential heritage. We are, therefore, mistaken in thinking that our moral understanding is logically distinct from our empirical comprehension, for moral theory is every bit as much a part of our conceptual scheme as is our empirical theory. The connection is intimate: moral statements contain empirical content - after all, evaluations are being made about actual or possible states of affairs - and if 'ought' implies 'can' then certain sorts of moral statements rely on the possibility of there being actual or potential states of affairs. So, moral talk seems to be as meaningful as empirical talk; each has cognitive content even if there is something more to the former than the latter.

The principles of our conceptual network apply uniformly across the various sectors of the web - that is, moral theory exhibits the same structural patterns of development as does empirical theory. Since moral talk has its roots in moral theory, the linguistic patterns of our language convey the meanings of the conceptual fabric, so that if we change the meaning of our embedding moral theory we thereby also change the sense we attribute to our words-in-use. Clearly, then, moral language, like empirical discourse, is not static but is a dynamic product in the flux of sensory experience and conceptual adequacy. In short, the definitions of our moral terms are given by their location in our moral theories, with their acceptance turning on whether the underlying theories are themselves considered to be satisfactory. The meanings of moral terms no more seem to be immune from revision than do the definitions of empirical expressions, so there really is no strong distinction to be drawn, at least on the grounds of meaningfulness, between the two classes of statement. In both cases the meanings of terms can be revised or even discarded when moral and empirical theories are found to be deficient or in error. What we are left with is the epistemic similarity of theoretical and linguistic constructions of the empirical and the evaluative.

Not only does evaluative thought have a conceptual structure similar to that of empirical theory, it is also characterized by the same sorts of methods of reasoning employed by empirical explanation. Moral thought employs both inductive and deductive logic, hypothetico-deduction, supra-empirical virtues, feedback-generated revision, and so on. Evaluative reasoning, and, for our purposes, moral reasoning, like empirical reasoning, consist of descriptive empirical statements, but unlike the latter

they do not consist of these alone. If they did, we would happily be able to infer from premises about the material world that some things are valuable and others not. But ever since Hume we have been stopped short of being able to do so by the apparent logical impossibility of deducing that because something *is* the case then ipso facto it *ought* to be the case.⁵ Descriptive empirical premises alone do not enable an evaluative conclusion to be drawn. What is missing, and what needs to be included to turn the argument into a valid normative one issuing in an evaluative conclusion is one or more evaluative premises. It should be noted that while the addition of a moral premise is required to reach a moral conclusion, this is merely to make a logical point; it does not deny, indeed it explicitly recognizes, that the content of the value premise(s) may be controversial, strongly challenged, or even revoked, and this may well lead to moral conflict. This substantive point will be returned to, but it is sufficient to say that the inclusion of an evaluative element is a necessary requirement of an argument if a moral conclusion is to be drawn. In short, evaluative conclusions are logically underdetermined by the empirical premises of the argument.

An evaluative argument, then, consists of a conjunction of empirical statements about what is and one or more nondescriptive statements about what ought to be. Taken together the descriptive and normative statements imply a normative conclusion which may be put to the test. Because empirical and evaluative statements, at least those beyond the experiential periphery of the system, do not possess their own empirical content and cannot be tested individually, the principle of holism applies. As with empirical theory, so too moral theory, none of the components of the conjunction are immune from revision, neither those of an empirical nature nor those axiological. Nowhere is this more clearly evident than in White's example of a woman and a fetus, an example which has been the subject of some discussion and is worth considering here.

Suppose, as White does, that there are two parties to a disagreement on the morality of abortion. The critic, an anti-abortionist, makes the following hypothetico-deductive argument set out in syllogistic form:

1. Whoever takes the life of a human being does something that ought not to be done.
2. The mother took the life of a fetus in her womb.
3. Every living fetus in the womb of a human being is itself a human being.
4. The mother took the life of a human being.

5. Therefore the mother did something that ought not to be done.⁶

At issue is whether the pro-abortionist, and indeed the mother, must accept the argument and its conclusion. The answer seems to be a firm 'No'. Just as with empirical theories where rejection of the observational implication leads to revision of the conjunction so too the denial of a moral conclusion demands reconsideration of elements of the moral argument. Assume the moral conclusion is denied. What then? Well, revision of the conjunction is required and this may be done in one or more ways: first, the implicit logical rule which permits the inference from (2) and (3) to (4) could be amended; second, we could surrender the ethical principle stated in (1) or retain it by building in exceptions (eg. 'Whoever takes the life of a human being, with the exception of fetuses,...'); and third, we could alter one or more of the descriptive statements consisting of (2) through (4). Any one of these moves would serve to return consistency to the denial of the evaluative conclusion (5). While all three are, in principle at least, open to us, it is less than plausible to suggest that all are of equal merit. Clearly enough, it would be an extreme move to seek any revision of a law of logic, although an error in the deduction is possible. But on this occasion such a blunder can be ruled out. Need we remove the moral principle contained in premise (1) and replace it with another? This could be done but it is not a necessary outcome of the rejection of (5), so need not be eliminated. Although it could be tightened up somewhat by including the notion of deliberateness to read 'Whoever *deliberately* takes the life...', this amendment would have no appreciable effect on the moral conclusion. And if both parties to the dispute agree on the moral principle then attention must turn to the third option, revision of the descriptive component. Premise (2) seems relatively uncontroversial if it is agreed that the mother deliberately brought it about rather than it happening as a natural consequence or for some reason over which the mother had no control and could not be held responsible for. While (4) is certainly problematic it is derived from (3). So, it seems that premise (3) is the most plausible candidate for revision.⁷

The pro-abortionist could deny that the fetus is a human being by disputing the claim that a fetus is an instance of the concept of human beingness. So controversy may rage over whether it is possible to identify the boundaries of being human. The critic, adopting conceptual analysis, may hold that it is possible to set out the necessary and sufficient conditions of the concept, and every fetus meets these criteria. The

proponents, on the other hand, may be wedded to the prototypical account of concepts and accept that a fetus sort of fits as an instance of a human being but is a highly atypical one at that, or they could deny outright any fit at all.⁸ While the prototypical strategy will not resolve the abortion debate, what it does allow is revision of the descriptive statement by amending the meaning of a concept in a descriptive statement. Being human would no longer count as being a necessary feature of fetuses. So, the rejection of the normative conclusion can be made consistent with the rest of the argument by eliminating one empirical premise and replacing it with another. In effect, an evaluative conclusion can, in some circumstance, lead to the rejection of a descriptive statement. As White has observed, we revise a segment of our conjunction "by adopting the descriptive statement that not every living fetus in the womb of a human being is a human being because we adopt the normative statement that in killing the fetus the mother did not do something that ought not to be done."⁹ Consistency is thus restored, guided by such supra-empirical virtues as simplicity, coherence, predictive power, minimum mutilation, generality, conservatism, elegance and comprehensiveness.¹⁰ But the conjunction does not stand alone; it connects up with the rest of our global theory so that one moral explanation may be judged better than another if the former combines these virtues in a more naturalistic manner than the latter.¹¹

So far, all that has been established is that evaluative claims, and especially moral ones, form part of our conceptual and linguistic systems and that moral arguments are subject to revision in the same manner as empirical conjunctions. All of this is hardly surprising given the commonality of both with regard to their genetic origins, learning and hypothetico-deductive structure. But the question now arises: if evaluative claims are, like their empirical counterparts, components of a unified network, are they likewise testable, and if so, how? Whether moral claims can be tested or not hangs on three things: first, are moral statements cognitively meaningful?; second, if so, against what are they to be tested?; and third, how are they to be tested?

Do evaluative claims, and more particularly moral statements, possess cognitive content? That is, if literally construed, are they either true or false? From within a noncognitivist analysis, value statements lack cognitive content, being no more than projections of subjective feeling or emotive sentiment. One of the clearest declarations of the noncognitivist status of moral claims was that espoused by Ayer:

In every case in which one could commonly be said to be making an ethical judgement, the function of the relevant ethical word is purely 'emotive'. It is used to express feelings about certain objects, but not to make any assertions about them.¹²

This sort of account has serious shortcomings. First, if the only guide to behaviour is one's emotive state there is always a danger of behaviour descending to the brutish. Any notion of moral duty, obligation or responsibility may very well be excluded if such emotions as anger, jealousy and the like come to the fore. Any semblance of a moral life may rapidly disappear.¹³ Second, because values are deemed to be no more than the expression of feelings, and there appears to be no rational basis for allocating different weightings to the various emotions, the noncognitivist position is relativist and self-defeating. Third, what noncognitivism fails to explain is how expressions about the value of things are reducible to expressions of emotive preference. Is 'X is good' the same as 'I like X'? It would seem not since X might be good even though not liked, or liked but not good. What is not allowed for is the rational possibility of one's preferences being wrong. Fourth, if what makes something valuable is arbitrary then anything can be accorded value. However, we do not tend to project value on just whatever takes our fancy. On the contrary, there does seem to be something more than personal sentiment alone which leads us to reach a large measure of agreement, sometimes almost universal, that some things are to be more highly valued than others and some things are not to be valued at all. Finally, contrary to the emotivist story, moral language does display many of the features of cognitive discourse. People do have deep moral convictions which go beyond mere emotive response. They are capable of entering into moral disagreement about the worth accorded this and that, reasons are given and evidence is gathered to add weight to or detract from moral views. Many hold that their moral values are more substantive than emotions alone, although what this additional attribute consists of is often a matter of puzzlement, but whatever it is, it is held to have some bearing on our talk that moral claims might be true, that we can secure rational agreement that some values are better than others, and that through reasoned discussion we can change other people's moral values and they ours. All in all, moral statements seem to be every bit as cognitively loaded as their empirical equivalents, and there seems to be no good reason not to treat them as such.

So, despite the emotivist challenge, evaluative statements do possess cognitive content and there is much to be gained from treating them as such. For one thing, it allows us to speak of values as something beyond mere subjective expressions; for another, we can put our moral claims to the test alongside those of an empirical kind. But acceptance of a cognitive attitude toward evaluative statements does not lead to our being in a position of judging moral claims to be true, for there is a school of cognitive thought which holds that while moral claims have cognitive content and are meaningful, none of them are true, or could ever be true, because there are no moral properties against which moral statements can be tested. Moral claims are, according to Mackie,¹⁴ subject to error theory: meaningful but false. For moral claims to be tested and found true, there need to be independent moral properties against which the statements can be assessed for their truth. Mackie's argument against the truth of moral claims is three-fold. Ontologically, if moral properties are objective entities then they far exceed the material fabric of the world. They would be very different from anything else since they would need to have motivational force to lead people to behave in accordance with them and have some connection with natural features of the world. The motivating force of moral values would require some causal account of how the quite remarkable powers of moral entities could bring about behavioural responses. This difficulty is supposedly overcome by showing that there is a connection between moral properties and material properties with the former supervening on the latter. Yet moral and material properties do need to be kept apart since the possibility of the truth of our values is not entailed by the truth of empirical claims. If there are the two classes of properties, it seems plausible to suggest that either a physical thing has all the material properties it has but not possess any moral properties, or that two things with identical material properties could have different moral properties, or that two things with different material properties could have identical moral properties. These possible permutations raise difficulties about the exact relation between the two. In the end, what Mackie and others deny is the existence of a *one-ought-not-lie* state of affairs which would make the moral claim 'One ought not lie' true. Epistemologically, how to acquire knowledge of moral properties presents us with an insurmountable problem. If there are moral properties and if they are to be apprehended, we must obviously possess some special faculty or sensory organ of moral or value perception with which

to grasp them. But we simply do not appear to have any such ability beyond our extant sensory mechanisms. It is quite inexplicable how our value judgements could be a consequence of our perceptions of some supposed valuative features of the world, although intuition, extrasensory perception and religious revelation are sometimes offered as a means of doing so. Axiologically, if values are non-natural properties, with moral values having motivational force and are able to be apprehended, how do these causal powers and perceptual understandings effect what we take to be good or bad, right or wrong? What needs to be explained is the moral persuasion of moral values, and no such explanation is forthcoming.

There is no denying that against its target the criticism of error theory hits the mark. It certainly has the twin virtues of eliminating objective moral properties from our ontology and making for a tidier epistemology, but where it goes astray is to suppose that the only form of moral reasoning is one characterized by non-natural properties and extraordinary sensory powers. The error theory trades on the mistaken assumption that moral realism necessarily requires commitment to non-natural, supervening and prescriptive moral properties. It does not. Moral realism embraces a variety of points of view unified by the conviction that some moral claims are true; what separates these variations is disagreement about what makes our moral claims true. There may well be those who suppose that what makes a moral claim true is the existence of some independent moral property, against whom the error theory hits home. But the alternative to this conception of moral realism is not emotive theory alone. There are other possibilities, still of a realist genre, which escape the type of attack against moral realism mounted by Mackie. A more plausible position is one which finds a middle ground between the extremes of moral absolutism contained in traditional moral realism and moral relativism rooted in moral emotivism. With moral absolutism it accepts that there is more to moral claims than personal preference alone, while at the same time siding with the emotivist view that individual moral sensibility cannot be discounted. Furthermore, concordance is reached with error theory that moral claims possess cognitive content, but there is a parting of the ways over the assumption that moral realism entails objective moral properties. Likewise, there is concurrence of thought with emotivist theory that moral and other values are intimately linked to the individual's tendencies, with divergence over the status of these attributes. What we are thus left

with is the development of a less pretentious explanation of values which coheres with the earlier accounts given of a material world and empirical theory. It thus goes without saying that a naturalistic version of moral realism must cohere with the rest of our theoretical structure so that the theories of meaning, truth, testability and so on applicable to other claims are germane, by extension, to moral claims. In this way, systematic consistency can be maintained.

Naturalized moral realism is a component of a larger system of naturalized realism and is bound by the ontological and epistemological conditions of the latter. Thus the naturalist and realist conception of empirical theory extends to the moral realm. To avoid any confusion over what is meant by the term 'naturalized' as it is used in such expressions as 'naturalized ethics' or 'naturalized moral realism', 'naturalized' should be taken to mean that the only things in the world are material things so if there are moral entities they must be material entities, and insofar as the realm of the evaluative is confined to natural phenomena then moral values should be investigated in just the same manner that governs inquiry into the empirical world. In its broadest sense, realism (including scientific and moral realism) provides descriptions and explanations of both observables and unobservables: it offers accounts about the behaviour of observable phenomena as well as putting forward hypothetical conjectures about unobservable theoretical entities which are posited to explain the observed. Just as theoretical assumptions about unobservables are required for scientific progress so too, on this unified view, are theoretical considerations concerning unobservables necessary for the growth of moral understanding. More narrowly, realism has various definitions, some of which serve moral realism well. Of these, three such senses deserve closer inspection. The first is a causal account of realism - that properties and entities have a causal function in the world insofar as they are components in causal chains. A second view of realism is epistemic - statements composed of concepts which refer to properties and entities depend on the way the world is to establish their truth conditions. And a third notion is where the truth of statements transcends our recognitional capacities - statements are true or false even though we are not in a position to verify their truth value.¹⁵

Before determining against what it is that moral claims are tested, we need to be clear about the nature of moral (and other value) claims themselves. Our moral claims

are usually about states of affairs, processes, things and behaviours, both actual and supposed, and are conveyed by such expressions as 'good' and 'bad', 'right' and 'wrong', 'should' and 'should not', 'ought' and 'ought not' and kindred notions. So we get such moral values as telling the truth is a good thing while lying is bad, murder is wrong, one ought to keep one's promises, and the like. However, moral values can be differentiated in various ways. To begin with, there are what might be called pseudo moral values, these being statements having the appearance of expressing an evaluation but which are merely descriptive.¹⁶ It is assumed that certain concepts are evaluative when they are not. Examples abound, including such concepts as lying, kindness and promising. For example, the concept of lying has a descriptive component - to describe someone as having lied is to state that the person passed on a falsehood with the purpose of deceiving. Must it have an evaluative component, in this case a negative evaluation? Lying may, from time to time, have a negative value attached to it but this does not seem to be a logically necessary feature of lying; on occasions lying might be the right thing to do, so can have a positive value attached to it. To lie might have positive value in times of danger; think, for example, of an undercover policeman protecting his identity or in times of war when an evil enemy must be deceived in order to win the conflict. Consider kindness. We can describe acts of kindness as meeting particular criteria, and such acts may be either beneficial to the recipient or, as we might colloquially put it, someone is killed with kindness. The point is that these and many other concepts all meet the descriptive conditions of their application but which we would not always evaluate, as with lying, adversely, and with kindness, favourably. So, while the descriptive conditions of a concept may be met in this world and other possible worlds (those past worlds and future worlds different from the world as it presently is) these concepts may, and often do, undergo shifts in the evaluative component attached to them. Thus, whether many of these descriptions have moral value depends very much on the way the world is at the time and the psychological state we are in. What seems clear is that the value of something depends not only on the material, social and psychological conditions prevailing at the time, but also on our holistic conceptual framework. Something's value is not given in isolation but is determined in conjunction with the rest of our axiological web so that particular evaluations may be revised as a consequence of alterations elsewhere in the system.

Meta-ethically, values may be classed as either reportive or prescriptive. When we say that something is good or bad, right or wrong, we are reporting its value, and this may consist of degrees. Something may be especially good, just good, bad or even extremely bad. Reportive values do not commit us to anything. Prescriptive values, on the other hand, go beyond the mere reportive because they are obligatory.¹⁷ To say of something that it should or ought to be done is to state that a person has a duty to perform the action in question. What is good is not synonymous with what ought to be since we can always ask of something good whether it ought to be. Keeping one's promises may be deemed to be a good thing but we can always seek whether, under such and such conditions, promises ought to be kept. There will be times when it is right not to do so. Moral claims containing 'good' are therefore not disguised 'ought' statements, and are not reducible to them. That this is so is evidenced thus: if we say to someone that a particular act is good he is still in a position of then being able to ask whether this is something he ought to do. After all, he may have other alternatives open to him which are also good. But when he (and we) hold an act to be obligatory, as being one which ought to be performed, it makes no sense for him to ask whether it is something which he ought to do. It just ought to be done. The only time it would be appropriate to ask whether one really ought to do what one had earlier agreed one ought to do is when we have second thoughts about the obligation we have put ourselves under.

Moral claims can be further distinguished according to whether they are instrumental or ultimate. Some moral values can be causally reduced to others insofar as they are instrumentally valuable as means to other ends. Where a particular moral claim is causally reduced to the status of an instrumental value, its relationship to other ends is, as Quine suggests, "transformed into a cognitive question of science."¹⁸ Something is morally good in this reduced sense if it contributes to the bringing about of some other good, with this causal connection being open to empirical investigation. Thus, we might accept that keeping promises is good, not in and of itself, but only insofar as it is conducive to the realization of some greater good, such as happiness. Whether keeping promises has this effect would be a factual matter, of empirically determining what causes what. Then there are our ultimate values, these being things good in and of themselves or possessing intrinsic worth. Some hold there to be a cluster

of such values including a few or many or all of the following which are required to give basic shape to various forms of life: freedom, autonomy, respect for persons, intellectual and aesthetic expression, pleasure, happiness, love and friendship, absence of pain, truth-telling and the like.¹⁹ Others, particularly utilitarians, claim only happiness has the status of being an ultimate end, all others in the cluster being subservient instrumental values. Whether one or many, ultimate ends, being unreduced and irreducible, still stand in need of some justification.

Before turning to the question of the justification of moral claims, however, it is important to first get clear about their genesis and ontological status. While our earliest preferences may be genetic, once born a child enters a social world where the acquisition of moral values takes on a decidedly social flavour. From our interactions with others and the world at large, and with ongoing experience, moral principles and rules emerge which we bring to bear on how to understand and deal with situations both prototypical and novel. Moral principles, such as 'It is wrong to harm other people', lay down ideals or exemplary standards against which to judge states of affairs including the behaviour of ourselves and others. In many cases these principles are accorded the status of ultimate values since they provide the criteria for reflecting on the worth of forms of life and types of conduct. Moral rules, on the other hand, offer practical guides to behaviour and possess more of a technical quality: they serve largely as instrumental values designed to efficiently and effectively achieve ends of greater worth. Moral rules, such as 'Boys should not hit girls', provide very clear and precise pointers to the sorts of behaviour to be displayed in a given situation and are justified by their relation to moral principles. Despite these differences, moral principles and moral rules share a common and fundamental characteristic: they are not absolute laws, nor are they a priori, necessary or analytic truths, nor are they intuitions. Neither are they derived from a conceptual analysis of the meaning of 'man' (in the sense of mankind) nor from pondering on the essence of human nature.²⁰ None of these sources comes anywhere close to providing an adequate account of morality consistent with naturalism. Rather, principles and rules have a social basis, being distillations of our understanding of encounters with our surrounds: as Johnson has put it, our moral principles and rules are best understood as "capsule summaries of the collective wisdom we derive from our shared moral experience as a community."²¹

What sort of ontological commitment do value claims carry with them? There do not seem to be any non-natural properties out in the world attached to entities or other such things which give them their value. A naturalized ethics is certainly not committed to there being unnatural, spiritual or queer moral properties over and above those of a material sort. So, the extreme moral realism objected to by Mackie is without warrant. Must we be compelled to accept that the moral realm consists of nothing but subjective expression, for there does seem to be more to morality than the emotive alone. What seems to be required is an ontology which posits something more than subjective emotive responses but less than independent moral properties. The question which must be addressed is this: does such an account of morality require moral realism to sustain its plausibility? The answer is both yes and no. To begin with the 'no'. The class of statements which are pseudo-values, contrary to the appearance of possessing both descriptive and evaluative properties, are solely descriptive. Because pseudo-values possess descriptive but not evaluative content, realism holds only for the descriptive component, not the evaluative. Accordingly, such values commit us to scientific realism on the grounds that the empirical part of, for example, a kind act, can be described, but they do not commit us to moral realism because there are no moral properties denoted by pseudo-moral claims.

Instrumental values are a little more complicated, for they seem to possess both descriptive and evaluative content. They are empirical insofar as they fulfil a causal role in relation to ulterior ends, and the efficacy of this relationship is open to scientific investigation. But instrumental values, unlike pseudo-values, are evaluative. Some things are held to be good, not in and of themselves, but because they produce, lead to or bring about other things of greater worth. Because instrumental goodness can be causally reduced to descriptive accounts, thereby possessing descriptive but not evaluative content, they too can admit of scientific realism but require no commitment to an ontology of moral realism.

Ultimate values possess both descriptive and evaluative content. They contain an empirical component because they either report or prescribe actual or potential states of affairs. However, while reportive values can be applied to a range of possibilities, real or imagined, prescriptive values are more proscribed: if ought implies can, then the demand that something ought to be can only be justified if it is possible, at

least empirically possible, for it to be so. But this is the least of the worries about the ontology of ultimate values. When we say of something that it is good in this ultimate sense, when it is ascribed intrinsic value, whether it leads on to a prescription or not, we are faced with the problem of determining how, or why, something is good in this sense.

By their very nature, ultimate moral values are at the end of the line. They cannot be causally reduced to either descriptive statements or to other evaluations. The question, then, is whether they can be justified, and if so, how? Some naturalists, especially Quine,²² point to the supposed methodological infirmity of ultimate moral values compared to scientific laws on the grounds that whereas empirical theory has a foothold in observable phenomena our moral principles have no comparable independent touchstone to rely on. This is the same argument as made by Mackie about moral properties, and both Quine and Mackie are, in one sense, correct. But Quine's position is made far more problematic by his claim that "there must remain some ultimate ends, unreduced and so unjustified."²³ For a start, it does not logically follow that because something is unreduced it is therefore unjustified. Being unreduced is one thing, being unjustified is quite another. It is not a logical contradiction to hold that ultimate values, although unreduced, can still be justified. Furthermore, as Flanagan²⁴ points out, the demand that our values be justified in some conclusive way is a demand not placed on science itself. Induction underpins both our similarity standards and our preference axis. But can induction be reduced to either the neural processes which drive it or to past evolutionary success? It would seem not, for by attempting to do so we are employing the very principles of induction which stand in need of justification in the first place. So induction remains unreduced, and, according to Quine, unjustified. And if this is the case then our values, or at least our hereditary values, are on a par with our primitive awareness of the world. So, the charge of the infirmity of values collapses. What of our social values, particularly our ultimate moral values? These are not open to neurological reduction, so cannot be justified biologically as our hereditary values are. But insofar as the ultimate moral principles, as components of our conceptual scheme, are far removed from any immediate sensory experience then they are no different from the most abstract and fundamental empirical laws and related theoretical assumptions of science which likewise are remote from the experiential edge. From within a holistic framework neither our empirical nor our evaluative claims can be reduced to

observational claims, as the argument for the underdetermination of theory by experience demonstrates. In the final analysis our fundamental empirical assumptions are no more reducible than are our moral principles, and so on Quine's account both stand unjustified. Yet, there does seem to be an important difference between them. In the case of the scientific assumptions, the history of science reveals that quite remarkable shifts have occurred with the replacement of existing theoretical axioms by superior ones with few, if any, being so well justified as to withstand the force of continuing scientific investigation. Is the same true of our moral principles? They, unlike their empirical counterparts, do seem to have a degree of permanence about them. They were evident in previous human societies, are present in contemporary communities, and will probably be found in future social arrangements. Given the remarkable stability of moral principles over time, it seems reasonable to suppose that there is something which anchors them as relatively invariant and would serve to justify our ultimate moral values.

Moral values may be justified in the following way. For human beings to survive beyond birth, to rise above the brutish, and to be able to formulate and pursue their life plans, we need to be members of social groups. Left to our own devices we would perish and never get to be in a position to flourish. However, for any sort of social arrangement to exist, be it a family, a community, or a nation state, a necessary requirement is that it must have a set of maxims governing the conduct of members which are binding on and regularly observed by them. Without some shared expectations of behaviour - rules to be followed, duties to be performed, obligations to be met - it is inconceivable how any form of social life could exist at all. Therefore, a moral code is a necessary condition for the existence of each and every social group. This, however, is no more than a formal requirement and tells us nothing about the substance of the required minimal morality. To this we now turn. All social groups are bound by a set of universal moral principles which place demands on all members. These principles are presupposed by the underlying structure of social life and are at least four in number and probably more: (1) justice - the reciprocity of claims requires that a claim made on others is also a claim on oneself; (2) succour - the giving of mutual aid and providing help in distress; (3) harm - the avoidance of inflicting gratuitous physical injury and pain on others; (4) honesty - of not deliberately deceiving others.²⁵

Of these moral principles, several observations can be made. The first is that their universality does not entail that all members of a social group must abide by them all of the time. Some may do so only sometimes, and a few perhaps rarely. But, on pain of social disintegration, many must most or all of the time. A second observation is that although the principles themselves are universal features of social life, to have any practical application in particular social settings they need to be translated into specific moral rules in order to provide practical guides to conduct. Whereas there is one universal set of ultimate moral principles, of sets of moral rules there can be, and are many. Thus the ultimate moral principles give all social groups their common moral core while the instrumental values and moral rules provide societies with their moral diversity. A third point to note is this: the engagement in various forms of life, shaped by the competing sets of moral rules, would not be possible in the absence of social groups. To pursue a moral life, however conceived, requires the membership of moral communities which themselves presuppose these ultimate moral principles. Finally, all human activity rests on the existence of social groups for their realization, and the social groups only exist on condition of these universal moral principles being present. Science, aesthetics, history and philosophy as well as sports, hobbies and casual pursuits all presuppose them and herein lies a justification of ultimate moral values. It may not be a perfect justification but it is about the best that we have.

The question of the testability of moral claims now needs to be addressed. Are moral claims testable, and if so how? The challenge mounted by some naturalists, Quine and Harman included, that moral claims while meaningful are nonetheless untestable, needs to be confronted. Quine states the position thus;

...one regrets the methodological infirmity of ethics as compared with science. The empirical foothold of scientific theory is the predicted observable event; that of a moral code is in the observable moral act. But whereas we can test a prediction against the independent course of observable nature, we can judge the morality of an act only by our moral standards themselves. Science, thanks to its links with observation, retains some title to a correspondence theory of truth; but a coherence theory is evidently the lot of ethics²⁶.

There are three important strands to this argument. All three are contentious, although the first is less so. But they will need to be countered if a solid case is to be made for the

testability of moral claims.

The first is this: both science and morality have an empirical foothold. That of science is in the predicted observable event while that of morality lies in the observable moral act. However, these two empirical footholds are not quite so distinct as Quine seems to imply. Prediction is not limited to observable events; we can make predictions about observable moral acts - whether someone will behave in a certain way in a particular moral situation. Since prediction holds for both science and morality, it cannot be advanced as a criterion for distinguishing between them. On the contrary, this only reinforces their similarity. Further, insofar as both events and acts are observable then they must both possess material properties, although whether moral properties are observable remains open. And the difference between an event and an act may not be all that significant given the intertheoretical reduction of folk psychology and mental states to neuropsychology and brain states.

It is the second strand of Quine's argument which deepens the issue. A scientific prediction or empirical claim about the world can be tested by observing some independent properties in the world. A moral claim about the world can only be judged against our moral standards since there are no independent moral properties in the world against which moral claims can be checked. Not only are there no moral properties, there can be no moral observations.

These two assumptions require a little more analysis. Is it the case that morality diverges from science so radically as Quine suggests? Scientific theory is tested against the world, and in the context of moral claims, Harman's examples serve us well to make the same point. Of the physicist observing a vapour trail in a cloud chamber, he posits a proton as the cause of the trail. While the proton itself is unobservable, the vapour trail serves as evidence for the presence of the proton and it also serves as evidence for the theory which hypothesizes that there are protons. Observation of the vapour trail therefore confirms the theory which gives the theoretical term 'proton' its meaning in the observational statement. What must be noted is that the presence of the proton is inferred from the observational evidence, yet the physicist accepts that there really is a proton going through the cloud chamber causing the vapour trail. So the claim 'There goes a proton' is testable against something independent of it.²⁷

Can we test moral claims in the same way? Quine and Harman think not

because, quite rightly, they deny that there are moral properties out in the world attached to objects, practices and the like, against which our moral claims can be tested. So, unlike scientific claims, for them moral claims cannot be tested against the world. But are they right? Well, let's consider Harman's moral example. Suppose someone, upon observing some children pour petrol on a cat and set it on fire, utters 'It is wrong for those kids to set that cat on fire'. The problem lies not with the empirical claim 'Those kids set that cat on fire'; it is reasonable to assume that it is petrol (or something similar) and not water, and that the speaker saw them do it. This claim can be tested against the observable event. No, the problem lies with the claim 'It is wrong for...'. What Harman wants to know is whether the claim that it is wrong to cause needless pain to animals can be empirically tested in the same manner as the physicist's claim. That is, can the wrongness of causing pain to animals have an observable effect in the world which serves as evidence for the moral wrongness and as evidence for the moral claim in the same way that a proton has an observable effect in the world which serves as evidence for the proton and as evidence for the scientific claim? Harman thinks not. Insofar as his account rests on there being moral properties (wrongness, oughtness, etc.) attached to things, he is right; moral claims cannot be tested in this way. But this does not exhaust the class of moral properties. When a physicist observes a vapour trail and utters 'There goes a proton' he is inferring from the vapour trail that it was caused by a proton, an unobservable entity accepted because it is required by the theory which he holds best explains the presence of the vapour trail. When someone observes children pouring petrol on the cat and igniting the animal, then utters 'It is wrong to set that cat on fire' there is a similar inference from what is observed to an unobservable. What is inferred from the observer's utterance is a moral disposition. Brower²⁸ suggests that a moral predicate like 'wrong' refers to the way a state of affairs brings about a particular response in a person. What lies behind the vapour trail and the utterance about a proton is a proton; what lies behind the burning cat and the utterance of wrongness is a moral disposition. There are marked similarities. In both cases the intermediary is independent of the claim uttered. In both cases the intermediary is causally linked to the observable phenomena - the proton caused the vapour trail, the disposition brought about the wrongness. In both cases the intermediary is what the claim is about - protons and the disposition of wrongness. The

only difference is that the proton is materially independent of the body of the person making the empirical claim while the disposition is materially connected to the body of the person making the moral claim. But within a naturalistic account of a materialist universe this dissimilarity carries no great weight. In dealing with causal relations it makes no difference whether the causes are external or internal to the utterer's body since the material world is a oneness and causal explanations are not troubled by the spatial distention. So, there are moral entities, our moral dispositions, independent of our moral claims against which these claims are held to be true. But just as we cannot observe protons neither can we observe moral dispositions.

The notion of moral dispositions is a critical one which at this juncture needs to be clarified. Values, moral and otherwise, are not out there in the world, independent of our claims and of ourselves, nor are they merely emotive responses. While they are neither, at the same they are a little of each. Values are dispositional - as such they are independent of our claims but are nonetheless tied to psychological processes. The dispositional structure of our values is composed of several layers. The deepest, and possibly the most minimal, level consists of our innate bipartite equipment, especially the most basic likes and dislikes ranged along our preference axis. Deepest because it comes first and is a universal requirement for moral life and minimal because moral life is inescapably social and so psycho-social factors take over from where genetics leaves off. So, while the hereditary values are all-embracing, they have little if any influence on the higher levels of our dispositional elements which may vary widely across social groups. It is at the more complex and intricate reaches of neural networking that our value dispositions operate in a causal capacity to generate appropriate behaviours and the expression of verbal claims. In the absence of an adequate psychoneural account of values, the language we employ, especially trait terms, take on the character of theoretical constructs which refer to psychological dispositions of sorts still largely unknown. The traits themselves stand as tokens for internal psychological phenomena which are causally connected to behavioural responses to morally evaluated states of affairs.²⁹ It is because of the acquisition of certain psychological dispositions that we value things as we do and respond to them accordingly. Dispositions determine what has value.

One of the virtues of theoretical trait terms is that they do not simply leave us with

emotional responses nor do they commit us to accepting non-natural ontological entities. Brower³⁰ has recently proposed an account of values - 'dispositional ethical realism' - which is not only consistent with naturalism but also extends the boundaries of contemporary dispositional explanations of moral (and nonmoral) values. His description of dispositional ethical realism helps to explain not only what values are but also sets out to make clearer their motivational force.

The moral properties of moral claims are entirely dependent on evaluator's dispositions to respond to circumstances and states of affairs, actual or supposed, which confront them. Expressed biconditionally, dispositional ethical realism may be stated thus:

X has value V if and only if evaluators E would, under appropriate conditions C, respond to X with reaction R.³¹

Let the place value of the signifiers be:

X = person, behaviour, object, state of affairs.

V = moral values, such as good or ought.

E = evaluators, being either all human beings or social groups.³²

C = conditions appropriate to responding in a morally evaluable way.

R = an inner psychological state, a maxim or a verbal expression, a behavioural performance.

This biconditional provides a means of reducing moral talk to nonmoral talk. To say that something is of value, that it is good, or it ought to be done, is to say that we are disposed towards it (or against it as the case may be) and the disposition is itself a neuropsychological phenomenon, acquired socially and displayed behaviourally. Moral thought can be reduced to nonmoral thought in the same way as any other ideas are reduced. It follows exactly the same pattern and procedure as the reduction of theories in the sciences, illustrated earlier by the reducing of folk psychology to neuropsychology. Just as, for example, the predicate 'is hot' can be more accurately specified as a level of mean molecular kinetic energy, so too can the predicate 'is good' be reduced to a dispositional state, although in this case the exact material nature of the reducing predicate remains not yet fully elaborated. Thus, reduction of scientific and moral theories (for these are what our values are) is driven by the common search for conceptual unity and theoretical simplicity in order to account for the scope of our

empirical and evaluative experience according to the least number of basic concepts, and hence deepen our understanding of the world and ourselves. As in science, so too with morality, successful intertheoretic reduction does not demand the retention of the conceptual meaning of the reduced theory, so it is quite expected that the reduction of a moral notion by a reducing nonmoral theory will almost inevitably bring with it a change of terminology and meaning, sometimes quite radical.³³ What is not required in theoretical reduction is the conservation of meaning, although it is evident that, as with empirical matters, where such expressions as 'is hot' still prevail in everyday discourse in the face of better explanatory accounts of heat, the same will also be true of moral predicates such as 'is good' when better dispositional descriptions of values become available.

The multi-layered dispositional structure of our values leads to complex dispositional interactions which affect our evaluations in several ways and removes morality from being merely emotivist subjectivity. First, there are epistemic dispositions which enable us to amend or eliminate various types of responses upon acquiring further empirical information. Or, put more correctly, empirical dispositions can lead to the revision or rejection of moral dispositions to respond in particular ways. Second, within a hierarchy of dispositions, second and higher order dispositions may over-ride first order dispositions. So an emotive response may be subjugated by a more theoretical and reflective disposition. Third, the relation of higher and lower order dispositions is not uni-directional top-down. As Brower³⁴ notes, there are certainly occasions when a higher order disposition prevails - the theoretical demand for consistency requires that two different responses be reconciled; at other times a lower order disposition may triumph - a burst of anger displayed by someone of otherwise settled temperament ; and sometimes, where dispositions at the same level are in contention, especially in cases of prescriptive evaluations, one will over-ride the other - where a behavioural response may be both just yet harmful, whether the behaviour is engaged in or not will depend on which disposition overcomes the other.

When earlier considering definitional accounts of moral realism, attention was drawn to three versions having particular relevance: causal, epistemic and constitutional. What now needs to be established is whether moral properties in the dispositional ethical realist sense meet these criteria for moral realism. Causally, moral

properties, being determined by our dispositions, have the same ontological status as physical objects and psychological states, and being material play the same sort of causal role in the world. Epistemologically, moral properties are independent of our moral claims. We can be mistaken in our ethical claims in at least two ways. First, because of the complexity of our moral psychology we can sometimes be wrong about our dispositions. A person may think he will respond to a particular situation in a certain way, but when confronted with an actual situation responds differently from that anticipated. Here, he is wrong about his moral dispositions. Second, there may be informational constraints which limit the amount of available evidence, so that ignorance may lead to the making of mistakes. Hence, we can be in error about ethical properties because of both self-misunderstandings about our dispositions and being misinformed about the descriptive properties of that which is evaluated. And constitutionally, moral properties are independent of our moral claims. That is, moral properties are not mental or conceptual phenomena. Our claims about the moral properties of things valued are dependent on our dispositional states for their truth and since our dispositions may very well be beyond our immediate recognitional capacity, then the truth of our moral claims transcends these claims. Moral truth is constrained by our dispositions, not by our thought. Because of the supposed methodological infirmity of ethics, Quine claims that "science, thanks to its links with observation retains some title to a correspondence theory of truth; but a coherence theory is evidently the lot of ethics".³⁵ However, insofar as values, moral and the rest, are dispositional and are observationally detectable by us, then our moral claims are guided by the discovery of things about ourselves, and so ethics is equally entitled to a Tarskian conception of correspondence truth at the level of language while also recognizing that an eventual psychoneurological account of representation will inevitably dispense with any theory of truth tied to sentential constructions.³⁶ One of the few to apply a Tarskian theory of truth to moral claims is Sayre-McCord³⁷ who sets out a disquotational specification of the truth conditions of moral claims: thus

'murder is wrong' is true if and only if murder is wrong.

establishes the form the specification of truth conditions will take when the metalanguage includes the object language. He also notes that a disquotational specification of truth conditions for 'murder is wrong' is not trivial, but uses English to

report something important about the relationship between the English language and the world, in this case a moral disposition. It is thus consistent with a correspondence theory of truth.

The issue of moral observation is central to the question of whether moral claims can be tested. Quine is clearly of the view that observation is limited to 'observable nature' against which empirical claims are checked, while moral observation is ruled out on the ground that moral claims are checked against 'our moral standards themselves', and so are not observationally testable. To determine the correctness of Quine's position against moral observation, the notion of observation first needs to be revisited. Consistent with the earlier account of observation, and with the requirement that since observations alone serve us poorly so that they must be replaced by observation statements, an observation sentence

is an occasion sentence that commands the same verdict from all witnesses who know the language. Consider, then, the moral occasion sentence 'That's outrageous'. In the hope of getting it to qualify as an observation sentence, let us adopt an unrealistic 'best case' assumption about our linguistic community, to the effect that all speakers are disposed to assent to 'That's outrageous' on seeing a man beat a cripple...that can be condemned on sight without collateral information.

Would 'That's outrageous' then qualify as an observation sentence?³⁸

Answering his own question, Quine thinks not, because the utterance 'That's outrageous' can be applied to other moral situations where the expression of outrageousness depends on collateral information which may not be shared by all witnesses. This, he asserts, is in contrast to the sentence 'It is raining' which almost never depends on collateral information not available to witnesses.

Despite the initial plausibility of Quine's reasoning, there are a number of difficulties with it which render it specious. One of the criteria that an observation sentence must meet is this: it commands the same verdict from all witnesses who know the language. In Quine's 'best case' all witnesses assent to 'That's outrageous', thereby fulfilling the first condition. But more is required for a sentence to be observational, namely, that it be assented to without the need for collateral information. This is also met in Quine's example, so the second criterion is also complied with. So why does

Quine hold 'That's outrageous' not to be observational? His denial rests on smuggling in a third requirement which is rather dubious. Quine claims that on many other occasions assent to 'That's outrageous' would depend on collateral information not available to all witnesses, so not all witnesses would assent. But the collateral requirement really fails to distinguish observational from nonobservational sentences, for Quine³⁹ remarks that "The sentence 'It is raining', in contrast, almost never hinges on information not shared by the present witnesses", which is to concede that on some occasions it does hinge on collateral information. The difference is not between never requiring and sometimes requiring collateral information, which are mutually exclusive categories but between rarely and often, which are points on a continuum, so where then to draw the line? It would seem that at least on some occasions, especially those not requiring collateral information, a sentence like 'That's outrageous' could be observational. But there is more to the objection than this. Quine admits that his example is unrealistic since it is most unlikely that all witnesses would assent to this particular sentence. However, one rather improbable sentence failing to meet the test of observability is not enough to conclude that no moral sentences can do so. A less extravagant response to observing a man beat a cripple might be 'That's wrong' which would seem to qualify well enough as observational. Certainly Harman⁴⁰ thinks that his example 'It is wrong for these kids to torture that cat like that' meets Quine's conditions for moral observation since it is the sort of moral claim to which witnesses would give their assent. Put otherwise, this sentence is observational because a particular stimulus would in almost all witnesses trigger the same response without the need for collateral information.

There is more to be said on the vexed problem of moral observation. All observation is theory laden, so what is perceived will depend in part on which theories are brought to bear. How we understand a state of affairs will be shaped by the sort of empirical theories we hold; so too, how we judge the same state of affairs will be decided by our moral theories. The observation that something is wrong can only be made according to the observer's understanding of the moral conception of wrongness, with the meaning of the concept of wrong resting on the place of the concept in the same moral theory. As Harman puts it,

if you round a corner and see a group of hoodlums pour petrol on a cat and

ignite it, you do not need to conclude that what they are doing is wrong; you do not need to figure anything out; you can see that it is wrong.⁴¹

Hence, our observation is governed by empirical and moral theories operating in tandem. Not one then the other, but simultaneously. Indeed, Harman⁴² goes so far as to suggest that "if we say that observation has occurred whenever an opinion is a direct result of perception we must also allow that there is moral observation, because such an opinion can be a moral opinion as easily as any other." This seems to be correct and, contra Quine, it is reasonable to accept that we can and do make moral observations. Moral properties, like many other human properties, are natural properties, in this case dispositions, and are to be studied observationally in the same way as the rest. Observation plays an important role in moral inquiry, bearing in mind that some of our observations are observations of ourselves, including self-observation through introspection.⁴³ Thus, once moral observations are conceded, such that moral theories can be tested against our moral observations, there really does not appear to be much difference between ethical and scientific claims when it comes to their testability.

Underpinning Quine's rejection of moral observation is the claim that 'we can judge the morality of an act only by our moral standards themselves'. What this suggests is an extremely tight connection between an act and our moral standards whereby the morality of the act is determined solely according to our moral standards. But this does not seem to be entirely right. There might be occasions when deontological constraints apply, where an ultimate moral value such as justice is the unwavering measure against which a particular act is uncompromisingly judged to be morally good or bad. The moral virtue is held absolutely inviolable and the act is directly accorded moral praise or opprobrium. Yet this is not the only way, indeed it may not even be the predominant way, by which we test moral claims. It may not be the 'observable moral act' which provides the 'empirical foothold' of a moral code but rather the consequences of the observed moral act; and it need not be by 'our moral standards themselves' that the consequences of an act are judged to be moral, at least in the sense of established moral values, for the consequences may themselves bring about a revision of our moral standards and so the act and its consequences are judged not by moral standards in place prior to the act but by new moral standards only extant after the act. And it is also possible that acts and their consequences can be morally judged

according to criteria other than those consisting of our moral standards.

The testability of moral claims may proceed in one of two ways, either of which is consistent with the teleological character of a naturalized ethics. Our views that something will bring about a dispositional response in us under a particular set of conditions can be confirmed by either engaging in actual practice by putting ourselves in actual or similar conditions or by conducting a thought experiment where we imagine the relevant conditions, and taking heed of what our responses are or would be. Practice provides an empirical foothold for the testing of moral claims within which a moral concept figures since the practical consequences of moral behaviour relevant to the claim provide direct feedback by which to evaluate the moral conception embedded in the claim.⁴⁴ This feedback consists either of the predictions we make about what our actual moral conduct will be and then observing how well they work out in practice, or by an ex post facto determination of whether a moral act falls under an espoused moral conception. Thus, practice does provide a constraint on our moral claims and serves as a mechanism for avoiding the sort of systematicity Quine is driven to. Yet practice has its limits in moral testability. Brower⁴⁵ suggests that often it may be more appropriate not to test our dispositions under actual conditions, especially since the checking of moral claims usually requires evaluator impartiality which may be absent in real-life situations through a tendency to favour one's own position over those of others, and normally demands that all relevant information be taken into account which may be weakened by a lack of time.

So we engage in thought experiments to help us determine what is right and wrong as a way of checking the validity of our moral claims.⁴⁶ By utilizing our moral imagination, moral evaluation and testing can be advanced by examining actual historical worlds and imaginary possible worlds where particular moral conduct and moral principles can be carefully considered. What this allows us to do is reflect on conditions not directly confronting us to draw out the likely consequences of doing this or that, such as how others may be affected adversely or beneficially, how relationships amongst people may be altered, what existing opportunities may be closed off and new openings opened up, and so on. One advantage of thought experiments lies in our being able to ponder at a more leisurely pace on how we would respond under specific conditions, and because we have time to contemplate on what we might say or do it is

more likely that we are in a better position to determine how we would respond. In this way, thought experiments appear to be a powerful means of gaining access to our moral dispositions which are fundamental to ethical truth. No less than with practice, thought experiments are essentially empirical since what we are exploring are our dispositions to respond under specific conditions. But the role of thought experiments is by no means entirely straightforward. Where we are confronted with relatively tractable moral instances, a simple thought experiment may suffice to bring out what an appropriate dispositional response should be, with additional time or information not changing our stance. But more complicated examples may arise where even augmented information and extended time are still not enough for a clear response to emerge from conflicting dispositions. This, then, may be one limitation of thought experiments. Here are some others. There might be times when a thought experiment fails to capture sufficient information required to determine one's dispositional response. Or occasions may arise where the case being reflected upon is so different from our previous experience that we are unable to determine what would count as an appropriate response. And there are times when the thought experiment, when extended to all possible worlds may lose empirical contact with our world and so no longer provide a guide to our moral responses in this world.⁴⁷

Although our moral claims are observationally testable, it should be noted that they, like their empirical counterparts, are not tested in isolation. Both types of claims are tested systematically in accordance with stringent coherence requirements. Moral claims are not tested singularly but only in conjunction with auxiliary assumptions which permit the logical deduction of a predictable observation concerning what a person ought to say or do. So, with the earlier example of the burning cat, there are background postulates which link the perceived state of affairs and the judgement of wrongness. These would include: petrol ignites when in contact with oxygen and a naked flame, burns to the skin cause great pain, pain is bad and needless pain is worse, and so on. Now, when faced with an inconsistency between a moral value and a moral observation, we can either revise our theoretical conjunction if we find the practical feedback compelling, or we can retain the overall moral framework and so resolve the dilemma by finding some way to reject the feedback. If the fault is deemed to reside with the theoretical structure, internal consistency can be restored in one of two ways: either

by holding on to the moral value and adjusting the auxiliary assumptions, or accepting the assumptions and letting the value go. Which to adopt is a matter of pragmatism. Or we can retain our theoretical conjunction because the nonmoral component seems indisputable and the ultimate value is held inviolable, come what may, even in the face of convincing disconfirming evidence or negative feedback which is not enough to compel us to revise or adjust our moral value. So the observation would be rejected.⁴⁸

There is, then, much in common between evaluative and empirical claims, or between ethics and science. Their similarities are governed by the holism of our conceptual framework: they gather their meaning from the theoretical network, they are tested in conjunctions, are checked against observational experience and practical feedback, and are revisable. The dualism between moral claims and empirical claims must be abandoned in very much the same way as that between analytic and synthetic statements has been forsaken. There is just too much congruence to conclude that ethics is methodologically infirm compared with science. This is not to cast aside the differences between evaluative and empirical claims for they are not identical nor is each reducible to the other. Holism serves to underline the point that they are, however, not separated by any epistemological distinction.

There are, nonetheless, some important dissimilarities between moral and empirical claims which do warrant attention. Two differences in particular serve to partially distinguish moral claims from those of a descriptive sort. One concerns moral conflict, the other touches on moral motivation. To deal with moral conflict first, both the class of empirical claims and the class of evaluative claims have a portion of their content which is widely agreed to and a portion which is disputed. In the moral realm, an indeterminate part is rather uncontentious: to start with, there are our innate values, some of which may be of a moral kind; then there are those social values required of any society for it to exist and without which any form of life would be impossible; there is also a general, possibly a universal, view that some things, such as pain, just are bad; and there are some basic human appetites (happiness) and aversions (torture). Our observation statements about these things, as empirical footholds for judgement, remain almost invariant. So, there is a moral core of largely unchanging moral claims and observations. And this differs little from the empirical domain. And with both there is also disagreement, even if less marked, publicly at least, in the empirical tract.

Certainly, moral conflict is more pronounced, and often proves to be more stubborn in its resolution. But even here the difference between empirical and moral disagreement is a matter of degree rather than kind, and although being less extensive, empirical conflict can, in some instances, prove to be as unresolvable as its more frequent evaluative counterpart.

Empirical and moral claims do vary insofar as many moral claims arise out of and are intimately linked to the particular needs and practices of localized social groups and individuals. Thus, a measure of moral pluralism is introduced into morality as people come to see things in diverse ways. Although this need not necessarily lead to moral (or value) relativism, moral variability does almost inevitably generate moral conflict. However, conflict between competing values can be mitigated, on some occasions at least, by various means. For a start, values do not stand in splendid isolation. Rather, values, as part of our conceptual network, are constrained by both empirical considerations (eg. ought implies can) and by their mutually reinforcing relationship. The coherence and unity of empirical and evaluative claims go some way towards reducing moral tensions. Some values in apparent contest may, after examination, turn out to be compatible after all. When opposing moral values are reducible to other values which secure the general agreement of contending parties then harmony is restored. Some values may also be reduced to instrumental values, so that agreement about their worth becomes an empirical matter:

Suppose that two individuals, A and B, have a disagreement regarding action *a*: A claims that *a* is moral, B claims the opposite. Sometimes such conflicts are resolvable by means of causal reduction. For example, A may attempt to convince B that action *a* is moral because doing *a* will cause *b*, where *b* represents a moral value that both A and B accept. B may not be persuaded by A's causal reduction. In either case, the moral conflict has been transformed into an empirical, scientific question about what causes what.⁴⁹

While these sorts of moves do go some way towards eliminating moral conflict, by no means do they remove it altogether. There still remains more than a vestige of divergent moral opinion, both amongst others and within ourselves. How these more fundamental moral constraints are to be settled presents us with a more difficult

problem. Where the moral tension is between ethically acceptable and ethically unacceptable alternatives, there is no contest - the choice is straightforward enough. Where the moral contrast is slight and we are faced with a choice between two ethically acceptable values of a very minor nature then little may hang on our preference. It becomes more serious when substantial intrapersonal conflicts give rise to agonizing moral dilemmas. Here, one is confronted with opposing moral claims, sustained by competing sets of justificatory support neither of which over-rides the other and together they are behaviourally incompatible. Now, while moral ties may ensue on some occasions, it does not follow that this is inevitable on all like occasions, since particular circumstances present at one time but not at another may tip the scales this way or that. But where there is a tie between competing moral claims, some way or another the deadlock must be broken. Where the moral claims are of a reportive kind, there is at least a minimum demand to restore consistency to the moral system; so one claim will eventually over-ride the other. Where the moral claims are prescriptive, then what we do will be based on acceptance of one rather than the other: what is clearly precluded is the conclusion that if one ought to do A because there is a presumption in favour of A and one ought to do B because there are compelling grounds for B then one ought to both A and B. It is a logical nonsense to say one ought to do both - one must perform one or the other, either one being equally acceptable. However, both do rule any other moral claims out of contention.⁵⁰ Where we have exhausted our own informational resources we might seek the advice and guidance of others in an effort to break the tie. Where this additional input is available, it may be all that is required to resolve the dilemma by favouring one alternative over the other. But on those occasions where there is no tie-breaker, we can do no more than go for one of the options and hope that we get it right. Only in hindsight might we know whether we made the best choice; and then, especially with prescriptive moral claims, it is too late to reverse the call. One simply has to live with the consequences, and get on with it. Out of it all, such practical feedback may help us to revise our moral thinking, particularly if we get it wrong, so that if there is a next time we might be in a position to make a choice based on what we have learned. So much, then, for intrapersonal moral conflict.

Where interpersonal moral conflicts arise out of opposing moral frameworks held by different individuals and groups, fresh problems are generated. Where these are

about basic or ultimate moral values, the question of their possible resolution is rather more troublesome. Initially, when an individual or group compares a moral claim or practice contrary to their own they normally do so from the standpoint of their own morality, upholding their own and disapproving of or even condemning the morality of others. But where the opposing individuals or groups attempt to engage in rational debate about the respective merits of the conflicting moral claims and practices then the moral contest moves to a higher plane. Assuming that the parties to the dispute are willing to enter into rational dialogue then there are some strategies which may help to defuse the controversy. As a first move, each side can acknowledge that rationality does not inhere in their own position alone - rather, with few exceptions, both factions usually have good grounds for holding to the positions they do. Further progress can be made if all parties to the dispute are able to reach agreement on the form of the disagreement. Some conflicts arise over classification: while there might be a consensus that all claims and practices of kind ABC are moral and all those which are ABD are immoral, the variance comes over whether a particular claim or practice is a case of ABC or ABD. Conversely, there might be agreement on the nature of the claim or practice - it is a case of ABC, but there is divergence over its morality.⁵¹ The recognition of a common core of moral values and observations may provide a sufficient base for the argument to proceed. Where the shared morality is sufficiently co-extensive to provide a single moral framework, the matter could be quickly resolved. But if there is insufficient overlap, further steps need to be taken. The assumptions of the opposing moral positions will now start to come in for closer scrutiny: the claim or practice may rule out the procedures required for rational settlement of moral conflict, it may rely on empirical claims which are clearly false, and there may be inconsistencies where the moral claim fails to cohere with the rest of the other party's moral values.⁵² Furthermore, when confronting others

we can show them implications of their view that they have not noticed - implications that either make them question their view, or else shows them a new way to think about things. We can also present persons who have a different view with an account of how things might be for all of us if certain values were lived out, certain types of relationships were formed, and certain social practices were realized. We can hold up for their

consideration a vision of what is possible, and we can explain how various values, principles and ideals hang together according to our idea of human flourishing.⁵³

We may even be able to demonstrate how these opposing values, if universally adopted, would render a society which embraced it either frail or impossible. If those with whom we are in disagreement accept our arguments and revise their morality accordingly (or vice versa as the case may be) then the moral conflict is resolved.

But what if they remain steadfastly unmoved by our arguments? If the dispute is over reportive values and nothing much hangs on urgent resolution, we may accept that the dispute cannot presently be resolved within current moral codes, go on to agree to disagree, and then await a future possible time when either one or the other of the positions further develops and hence gathers greater weight, or another more-embracing alternative emerges which is superior to its rivals. But this luxury is not available to us when the conflict is over competing moral claims about what ought to be done when the doing is imminent. As Quine points out, "even in the extreme case where disagreement extends irreducibly to ultimate moral ends, the proper counsel is not one of pluralistic tolerance."⁵⁴ Choices have to be made and acted upon, and where the moral judgements are of a serious nature there may be grounds for one party in the dispute intervening to prevent the other side from doing that which they claim they ought to do. Such intervention should not be taken lightly and is severely constrained: intervention is quite impermissible if (1) harm only befalls those who engage in the moral practice or acquiesce with it and (2) they do so foolishly albeit well-informed of the harmful consequences which may or will visit them. Coercive intervention is legitimate only when (1) others, who do not share the moral judgement, would be harmed as a consequence and (2) the individual or group who engages in the moral practice would be harmed, are ignorant of this, and there is no time to inform them of their impending misfortune.⁵⁵ Just how far should this non-paternalistic intervention go? There will be times, hopefully few and far between, when "in an extremity we can fight, if the threat to the ultimate value in question outweighs the disvalue of fighting."⁵⁶

The second feature to distinguish moral from empirical claims is moral motivation. Unlike empirical claims, there seems to be some sort of connection between moral claims, especially prescriptive moral claims, and an obligation to

actually do what one thinks one ought to do. Explanations of moral motivation fall into two classes - internal and external. The internalist account places great weight on motivation somehow being built into moral judgements. This 'somehow built into' is a matter of something like conceptual or logical necessity, self-evidence, a priority or analyticity where the very meaning of moral concepts links motivation to moral judgement.⁵⁷ However, this internalism sits uncomfortably with the naturalism developed here. Rather, consistency demands an externalist account: it is as a matter of empirical or causal necessity that an evaluator E who has an awareness of value V in conditions C will also have motivation M to respond with reaction R, R in this case being a behavioural performance.⁵⁸ Unlike conceptual necessity, the empirical necessity of dispositional ethical realism allows that if a person forms a moral judgement under inappropriate conditions there is no requirement that the person is obligated to see it through. However, under appropriate conditions a relevant behavioural performance normally results from the making of a prescriptive moral judgement: where such a judgement leads to motivational indifference, this would not only be extremely atypical but would almost certainly point to either a psychological disorder or a cognitive deficiency about what prescriptive moral reasoning requires.⁵⁹ In short, there is no logical necessity connecting every moral judgement to a performative obligation. What, in a naturalistic account, serves as a motivating force is something like sympathy or empathy, these being dispositional traits which causally explain our motivation to do what we hold we ought to do. Thus, a person with these dispositions who makes a prescriptive moral judgement about what ought to be done will, under appropriate conditions, be motivated to do it.

Turning from meta-ethics to practical ethics, the question arises of what sort of substantive moral theory ought to prevail. Like all other theories, moral theories seek to unify various concepts and principles into a coherent system to encompass the fullest extent of our moral experience in the most economical way possible. The greater the unity with the least number of basic assumptions the deeper our understanding and the wider the coverage to incorporate new and sometimes novel moral experiences. Some of the more prominent candidates for consideration include

the prototype, *party to a contract*, with all that that suggests. A different but closely related account bids one conceive all of one's moral decisions

under the prototype, *maximizing private benefit under collective constraints*. A third attempt to unify all of one's moral precepts is by seeing them as instances of *universalizable rules*. A fourth claims unity for them as *maximizing general utility*.⁶⁰

If any of these prototypical moral theories are to meet the requirements demanded of a naturalized ethics, one thing asked of them is that they be consistent with our best empirical theories of cognition. A realistic moral theory must cohere with our foremost psychological theories, although it must be recognized that this coherence will be tempered by the revisability of empirical theory and changes to our psychological states as a result of reflecting on social changes. Thus, an acceptable moral theory must satisfy the principle of minimal psychological realism:

Make sure when constructing a moral theory or projecting a moral ideal that the character, decision process, and behaviour prescribed are possible, or are perceived to be possible, for creatures like us.⁶¹

Thus the application of the principle of minimal psychological realism to the moral realm tends to rule out a number of moral theories. Although this is not the place to consider the candidate moral theories in detail, utilitarianism in particular has been singled out as a good example of a failing moral theory.⁶²

THE TASK AHEAD

Having set out the basic assumptions of a naturalized philosophy and sketched in many of the details to round out the picture, the implications for research now need to be considered. While a naturalized philosophy can be seen to underwrite social inquiry in general, the focus in the final chapter will be on exploring its significance for one particular branch of empirical investigation, namely, research into the administration of educational organizations.

NOTES

- 1 Although the domain of values embraces what are commonly called, variously, social, political, religious and aesthetic values, and all of these may in their several ways impinge on inquiry, the case to be made for the inclusion of values into the system will rest primarily on a consideration of moral values on the twin assumptions that moral values are the most fundamental values and hence an argument in favour of them is, ipso facto, to a large extent an argument in favour of all.

- 2 Unlike epistemology, the naturalization of values, especially moral values, has received much less attention. It is a project still very much in the making rather than having a measure of completeness. Being in its infancy, it has yet to benefit from any sustained and systematic working through of the central issues. While there are strands of serious disagreement on some matters and agreement on others, there is a pressing need for the disparate musings to be brought together if a coherent account of naturalized values is to be arrived at. It should also be noted that a useful starting point in developing a naturalized axiology is the work of Quine (1981a) who was one of the first to explore how values could be naturalized. In his analysis of the rival views of Carnap and Quine on ontological commitment, Rudner (1953, 5) points out that Carnap's distinction between external (practical decisions about what kind of linguistic framework to choose) and internal questions (theoretical problems which arise from the chosen framework) permits the relegation of values to the class of external questions, thus the separation of facts and values is preserved. However, if a Quinean type of holism is adopted, as Rudner and White (1981, 1986) suggest, then the distinction collapses and these values form a continuation of the conceptual framework. Unfortunately, Quine's account fails to live up to its promise, and while it is important to establish what is worth retaining and building upon, it also contains some extremely problematic assumptions which must be either amended or rejected if an adequate naturalized axiology is to be developed.

- 3 While Quine (1982, 61) acknowledges that our modest headstart is a matter of physiology about which we know very little, Flanagan (1982, 61) is more forthcoming in pinpointing the locations of both the epistemic and affective components in the central nervous system:

...the limbic portion of the central nervous system contains some sort of phyletic memory of basic goods, some sort of epistemic representation of the past successes of the species. The cerebral cortex, inter alia, takes care of the present, deploying its similarity metric to calculate some novel experiential token is a member of one of the limbically encoded primary reinforcing types.

- 4 Churchland, 1986, 299; Goldman, 1993, 128-30; Johnson, 1993, 9.

- 5 Hume, 1968, 469. However, the view that descriptive statements which assert that what is the case are distinct from evaluative statements about what ought to be so may get a little blurred around the edges. White (1981, 12) suggests that holding that something ought to be done can be construed as thinking something is the case because a sentence like "I ought to tell the truth" can be turned into "It is the case that I ought to tell the truth." However, as he rightly notes, there is a logical gap between "I ought to tell the truth" and "I do tell the truth" which remains unbridgeable even if the expression "It is the case that" is placed before each statement. Nor is it easy to see how evaluative statements can be reduced to, or are synonymous with, empirical statements.
- 6 White, 1986, 652.
- 7 The denial of (5) does not logically entail the denial of (3). On its own (3) cannot imply (5); it does so only in conjunction with the other members of the conjunction. So, a mixed conjunction, one consisting of descriptive and evaluative premises, may issue in an evaluative conclusion, but when the conclusion is rejected we are then faced with the choice of disavowing either an evaluative claim or an empirical statement. Which to give up is not easily determined. Even White (1981) is ambivalent: in his analysis of a particular example (p 51) where a moral principle is firmly entrenched and may be socially inconvenient or embarrassing to revise, he suggests that the moral principle will be retained, especially in such cases where the community regards the moral laws as God's law. Here, descriptive statements are the prime candidates for revision. Hence, parallels can be drawn between the amendment of a minor empirical statement rather than a major moral principle and the correction of a minor empirical statement instead of a major empirical law. Yet, only a few pages on, White cautions against exercising the option to give up descriptive statements in mixed conjunctions. Such a maxim, he thinks, would "acknowledge the dangers of recklessly amending or surrendering descriptive statements" (p 65).
- 8 Goldman, 1993, 128-9.
- 9 White, 1986, 653. White also points out that the revision of a normative conjunction by rejection of a descriptive statement as the consequence of a recalcitrant evaluation is analogous to Quine's revision of an empirical conjunction by amending a descriptive premise as the result of a recalcitrant observation. Quine (1986, 663) concurs with this, agreeing that the reasoning is plausible at least on its own terms.
- 10 Churchland, 1989, 302; Evers, 1987c, 26; Moody-Adams, 1990, 230; Sayre-McCord, 1988b, 277; White, 1981, 35.
- 11 While value considerations can undermine descriptive statements, the reverse also applies. As theoretical advances are made in various branches of empirical inquiry, such as history, social anthropology, economics and sociology, changes are brought about in what we value. In the light of increased understanding new

values may emerge, while changes in social conditions can just as easily prompt modification of our conceptions of the worthwhile or desirable. But the influence of empirical theory is not limited to those bodies of cognition alone. The cognitive sciences are also proving to be potent in their effects on the normative. As new theoretical discoveries are made about our conceptual frameworks and reasoning processes which overturn previous convictions about them, then our traditional values now at odds with our revised learning themselves get reshaped. So, rather than seeing the moral realm as given by a deity or some other authority, values are seen to be revisable and the consequence of considerable human imagination. In brief, our conceptions of what is good, right and proper are very much structured by how we conceive of ourselves as persons in a social environment.

- 12 Ayer, 1971, 143. This position rests on the logical positivist maxim that meaningful discourse is either analytic or has an observational basis. Mathematics and science meet these criteria but morality does not, so lacks meaningful and cognitive import. However, the force of this stricture was weakened somewhat by more moderate versions of positivism which allowed that some moral claims such as 'Murder is wrong' could be reduced to descriptive statements about a person's psychological state. Prescriptive moral claims about what one ought to do, however, were still construed as noncognitive since there is no logical connection between statements about what is the case concerning a person's psychological state and statements about what the person ought to do (Flanagan, 1982, 64).
- 13 This seems to be the sort of position adopted by Quine (1981a, 65) in his account of moral values, where he writes "we can still call the good good and the bad bad and hope with Stevenson that these epithets may work their emotive weal." As Moody-Adams (1990, 227) notes, Quine's view is not much more than the emotivist notion that moral talk is nonrational. It is perhaps surprising that Quine should advocate the logical positivist position on ethics in view of his criticism of this philosophical stance. Flanagan (1982, 1988) and Moody-Adams (1990) have criticized Quine for this inconsistency while Gibson (1988a,b) has sought to defend the Quinean thesis.
- 14 Mackie, 1977, 40-1. Mackie's objections to this more extreme form of moral realism are echoed by Churchland (1989, 297) who points out that ontologically there is no objective configuration of moral properties to which moral statements could refer, and epistemologically we have no sense organs for detecting so-called moral facts as we have for finding material things.
- 15 Brower, 1988, 689; Sayre-McCord, 1988a, 5.
- 16 Brower, 1988, 676.
- 17 White, 1981, 97-9.
- 18 Quine, 1981a, 64. Thus, a value such as 'One ought to keep one's promises' is not an ultimate value but is only justified by its instrumental relation to an ultimate

value such as 'One ought to respect other people' or 'One ought to be truthful to other people'. The immorality of some item of behaviour, such as telling a lie, will likewise be measured against our ultimate values (Flanagan, 1982, 70).

- 19 Boyd, 1988, 203; Flanagan, 1988, 548; Johnson, 1993, 255-6; Strawson, 1961, 11-2.
- 20 Flanagan, 1991, 54; White, 1986, 661.
- 21 Johnson, 1993, 256.
- 22 Quine, 1981a, 63.
- 23 Quine, 1981a, 64.
- 24 Flanagan, 1982, 68-9.
- 25 Strawson, 1961, 11-2.
- 26 Quine, 1981a, 63.
- 27 Harman, 1986, 64; 1988, 121-2.
- 28 Brower, 1993, 229.
- 29 Brower, 1993, 221; Flanagan, 1991, 279; Goldman, 1988, 162.
- 30 Brower (1993, 221 & 236) is not the only one to see the merits of making moral considerations consistent with Quinean naturalism. Unlike other forms of dispositionalism which have been advanced in ethical theory, such as analyticity, conceptual analyses of meaning, or intuition, all of which are deemed irreducible, dispositional ethical realism rests on a rejection of the analytic-synthetic distinction to develop a fully naturalistic explanation. Thus, moral values are empirically discoverable and "are to be studied in the same empirical spirit that animates natural science" (Quine, 1969a, 26). What dispositional ethical realism generates is an explanation of morality which arises out of empirical inquiry into actual dispositional qualities. Boyd (1988, 188), Flanagan (1982, 56) and Gibson (1988a, 175) all share the conviction that ethics must be naturalized within Quinean naturalism.
- 31 Brower, 1993, 222.
- 32 The requirement that E be restricted to either all human beings or to social groups, with individuals excluded, rests on the argument that because morality is inescapably social and not subject specific, dispositional ethical realism would have little to offer if the moral properties of each person's values are reduced to what is good for the individual rather than what is good in a more general or even universal sense.
- 33 Brower, 1993, 227-8. See also Churchland (1989, 302) and Evers (1987c, 9).
- 34 Brower, 1993, 231.
- 35 Quine, 1981a, 63.

- 36 Churchland, 1989, 351; Flanagan, 1988, 543-4; White, 1986, 654.
- 37 Sayre-McCord, 1988a, 20.
- 38 Quine, 1986, 664.
- 39 Quine, 1986, 664.
- 40 Harman, 1986, 58. It should be noted that while Harman explicitly adopts Quine's notion of an observation sentence he arrives at an opposing view to Quine over the possibility of moral observation sentences. Others to reject Quine's view as well as the appropriateness of the 'That's outrageous' response include Flanagan (1988, 544-6) and Moody-Adams (1990, 227-8).
- 41 Harman, 1988, 120. The theory-ladenness of moral observation is seen by Boyd (1988, 207) to be an aspect of a more general phenomenon of the theoretical character of morality.
- 42 Harman, 1988, 121.
- 43 Boyd, 1988, 206. This point connects up with the discussion in chapter nine of introspection as theory-laden.
- 44 Flanagan, 1982, 71. Moody-Adams (1990, 228) supports Flanagan's strategy of seeking an empirical foothold for ethical theory in practice, although Gibson (1988, 171), while accepting the consequences of observable moral acts, seeks to limit its scope to instrumental values.
- 45 Brower, 1993, 229.
- 46 Brower, 1993, 224; Flanagan, 1982, 71; Harman, 1986, 60; Sturgeon, 1988, 231. In addition, as Flanagan (1982, 73), Harman (1986, 60) and Sturgeon (1988, 231) all note, thought experiments are not just limited to the moral realm. Empirical scientists also employ thought experiments to test their scientific theories, particularly when they devise hypothetico-deduction to seek elaboration of their theory and connections with established empirical observations.
- 47 Brower, 1993, 230-2. There is a particular problem with the possible worlds argument. Normally, when we formulate moral claims we do so against assumptions about the world within which they will apply. It is clear enough that a thought experiment will become disconnected from its empirical base and give up whatever evidential power it might have if the hypothetical world deviates markedly from our actual world. To illustrate this, Brower (1993, 241) suggests that
- we can imagine a world in which, for example, our dispositions are to respond favourably to the random torture of innocent people. But the mere fact that we can imagine ourselves this way does not show that random torture is acceptable. Moreover, we can say

which properties of random torture make it objectionable. To merely begin to get at the phenomenon, we can note that torture causes great pain and that we take causing pain to be bad; we can note that random torture is worse, since it is not based on anything resembling desert or blameworthiness; we can note that performing torture reduces torturers to the level of brutes, and we take this to be bad, and so on.

In considering this possible world, approval of torture would clash with an empirical claim that torture causes pain; and with a moral disposition to disapprove of that which causes pain. The approval of torture would not make it acceptable and so we are forced to accept Brower's (1993, 232) conclusion that "thought experiments are meant to test our theories against what we find acceptable in this world, not what we find acceptable in a radically different world."

- 48 Flanagan, 1988, 547-8; Goldman, 1988, 169; White, 1988, 169. Furthermore, as Sayre-McCord (1988b, 260), Sturgeon (1988, 232) and White (1986, 651) all remark, the holism of Duhem and Quine not only encompasses physics and empirical science respectively, but is equally applicable to morality. According to Sayre-McCord (1988b, 260),

there is reason to think moral theory passes the testability requirement in the same way any respectable scientific theory does - even if moral properties count as unobservable. Of course, how scientific theories manage to pass the testability requirement is a notoriously complicated matter. As Duhem and Quine have emphasized, scientific theories do not pass the testability requirement by having each of their principles passed independently; many of the theoretical principles have no observational implications when considered in isolation. Observationally testable predictions may be derived from these scientific principles only when they are combined with appropriate background assumptions.

In the same way, certain moral principles may not be testable in isolation. Nevertheless, when such principles are combined with appropriate background assumptions, they too will allow the derivation of behaviourally testable predictions.

- 49 Gibson, 1988a, 162.
- 50 Brower, 1993, 142-3.
- 51 Gibson, 1988b, 535.
- 52 Goldman, 1988, 157.
- 53 Johnson, 1993, 259.
- 54 Quine, 1981a, 64-5. Quine's position is somewhat complicated by what he has written elsewhere:
Directed as it is to the welfare of society, morality hinges on

demarcation of the pertinent society. An isolated tribe could rest with crystalline moral law, seemingly absolute and eternal, recognized by all and obeyed by most. Conflict between societies is outside society and is thus morally neutral, until we widen our horizons and fuse many societies as one (Quine, 1984b, 74-5).

Gibson (1988, 164-5) takes Quine's claim that 'conflict between societies is outside of society and is thus morally neutral' to mean that two equally justified but incompatible systems of morality are both deemed correct. This, says Gibson, is moral relativism. But is Quine really a moral relativist? It would appear not for he writes: "we widen our horizons and fuse many into one" so that conflict between societies is now inside society and hence no longer morally neutral.

- 55 Goldman, 1988, 144-5. This view is very much in line with that expressed by Mill (1956) in his essay 'On Liberty'. Mill expressly excluded children who have yet to reach the maturity of their faculties. The same can be said of intervention in moral conflict.
- 56 Quine, 1981a, 65.
- 57 White, 1981, 101.
- 58 Brower, 1993, 235. See also Boyd (1988, 215) and Goldman (1988, 162).
- 59 Boyd, 1988, 215.
- 60 Churchland, 1989, 303.
- 61 Flanagan, 1991, 32. Flanagan's principle of minimal psychological realism has received strong support from Goldman (1993, 151) and Johnson (1993, 239).
- 62 According to Goldman (1993, 151)
 moral theories like utilitarianism may fail to satisfy this principle because they may require more altruistic behaviour, or more universalism, than is feasible for human beings. In its simplest form, utilitarianism says that a person should always choose actions that produce the greatest net happiness - where the happiness of everyone affected by an action is counted equally. If you are the agent, this means weighing other people's happiness as much as your own, the happiness of a neighbour's or a stranger's child as much as the happiness of your own child, and so forth. Some theorists worry that it is beyond the psychological capacity of human beings to comply with this precept. If so, Flanagan's constraint would require the rejection of utilitarianism as a moral theory.

CHAPTER ELEVEN

THE IMPLICATIONS OF NATURALIZED PHILOSOPHY FOR RESEARCH INTO THE ADMINISTRATION OF EDUCATIONAL ORGANIZATIONS

In the last five chapters, a systematic account of the basic assumptions of a naturalized philosophy of inquiry has been set out in considerable detail. The task of this final chapter is to consider the implications of naturalized philosophy for research into the administration of educational organizations. The implications to be discussed are of two kinds: those which tend to have a direct bearing on the day to day practices of researchers and administrators and those which are of a more abstract sort. The former have greater practical value since they provide guidance and procedures for the actual conduct of inquiry and administration: the latter, being more conceptual, serve to point out some of the important ways in which a naturalized philosophy not only differs from its 'paradigm' rivals but suggest ways in which it might be judged an improvement on them.

IMPLICATIONS FOR RESEARCH PRACTICE

Naturalized philosophy bears directly on the day-to-day practice of research into the administration of educational organizations. Its impact can be depicted by reference back to the central features of a naturalized philosophy. To begin with, it stresses the importance of the sensory receptors of the investigator (and of the research participants) as the boundary of our contact with what is being investigated. With the stimulation of our sensory mechanisms we theorize about the source of these stimulations, thereby positing things external to ourselves (eg. tables, chairs, children). As the source of our sensory stimulations, these posits are causally related to our stimulations and to our theories about them. And so we arrive at the conclusion that there is a world external to the investigator and that the researcher's observations, all of them from the most sophisticated to the most mundane, are theory laden. (See Chapter 7) That our observations of the things around us, including other human beings and

what they do, are theoretical should alert the inquirer to the possibility that because those participating in research (as well as other researchers) may employ different theoretical orientations towards their sensory stimulations they may therefore have opposing explanatory accounts of what the world consists of and how it works.¹ Such an understanding should warn researchers of the likelihood of empirically equivalent but logically incompatible theories, or to put it more simply, theoretical pluralism.

The effects of this fundamental point are several. There is no escaping the consequence that there is no such thing as theory-free research since all observation is theory laden. Whilst for most researchers the more complex facets of behaviour in educational organizations are clearly theoretical since new conceptual insights are generated and new words are coined to express them, for many investigators the observations of simple everyday activities, communicated in the common idiom, do not appear to be theoretical, so taken for granted are they (eg. She is sleeping). Similarly, the things which our mundane observations are about, familiar bodies (eg. tables, chairs), do not have the appearance of posited entities, but they too are just that. Once it is realized that all that we posit as external to ourselves is theoretical then the usual distinction drawn between the observational and the theoretical collapses, so that researchers now need to begin with the basic assumption that everything in inquiry is theoretical, and therefore revisable.

The construction of a theoretical system, or conceptual scheme, to provide a linkage between sensory stimulations and causally connected entities, provides a logical framework for inquiry. Theory formulations, the vehicles for the communication of theories, possess a sentential structure: there are occasion sentences, true or false on each occasion of utterance, which include but are not limited to observation sentences (eg. It is raining). Then there are eternal sentences, true or false on many occasions (eg. Iron bars expand when heated). The observation sentences, those closest to the experiential edge, provide evidence about ordinary bodies, and so settle the empirical evidence for the theoretical system as a whole. The theoretical sentences, located more towards the centre of the system, permit the relating of individual observations under a more general principle. As evident as this may be to educational researchers, there is nonetheless a logical problem in supposing that this is all there is to the semantic structure of inquiry. The particular observations, or

observation sentences, on their own cannot inductively generate the required generalization since the scope of the generalization extends beyond the limited empirical evidence which supports it: on the other hand, theoretical statements which account for the specified observation sentences cannot, on their own, deductively imply them. This being the case, there needs to be an intermediary, a logical connector, between observation sentences and theoretical statements, to allow for the testing of theories by reference to observational evidence and for observation sentences to serve as evidence for theories. This is where observational categorials assume a crucial role, for highly theoretical sentences can only imply a generalized observation categorical, not a particular observation sentence. (See Chapter 8) Since the observation categorical is a generalized observation sentence, being a compound sentence consisting of an observation sentence reporting the initial conditions followed by an observation sentence detailing a second set of circumstances (If A then B), then it is the observation categorical, not the observation sentence nor the theory formulation which is the immediate focus of empirical testing.

The observation categorical, couched in such expressions as 'If this, then that' or 'Whenever this, then that', is logically connected to the theory formulation by implication, thereby playing an important function in determining the truth of a theory. Similarly, the observation categorical is tied to observation sentences since the observation sentences (eg. This piece of iron expanded when it was heated) are instances of the observation categorical (eg. If iron is heated, it will expand), and the truth value of an observation categorical is determined by whether a predicted observation yields to the causal regularity contained in the observation categorical. The researcher understandably targets a particular instance of the observation categorical when investigating some aspect of the administration of an educational organization by attending to the initial conditions of the specific setting and accounting for the results. What is not always recognized is that the individual observation, reported in an observation sentence, serves as evidence for the observation categorical, and in effect stands as the test for the veracity of the observation categorical. The truth of the theory is arrived at by implication. If the observation sentence is consistent with the observation categorical then the observation categorical retains its truth value, and since the observation categorical is implied by a theoretical conjunction then the truth of an

observation categorial implies the truth of the implicating theory. However, where an observation fails to square with the causal regularity of the observation categorial (eg. This bar of iron did not expand when heated), then the researcher is entitled to conclude one of two things: either that the observation sentence should be retained so it is the observation categorial which is defective, or the observation categorial is saved and the observation sentence let go (eg. The iron bar did not expand because not enough heat was applied over a sufficient period of time). The first carries with it repercussions for the content of the theoretical conjunction, the second does not. (See Chapter 8) For the researcher, what is of paramount importance is the crucial role played by the observation categorial: it is the linchpin in empirical research - save it and the theory is saved, give it up and somewhere in the theoretical conjunction revision is required. (If the observation sentence 'This iron bar did not expand when heated' is retained, then the observation categorial 'If iron is heated then it will expand' will need to be revised to incorporate the anomaly. A revision of the observation categorial would also require adjustment to the theoretical conjunction which implies it - eg. revision of molecular theory). This, then, constitutes the logical structure of inquiry, to which all research and all researchers are formally bound. In short, because a theoretical conjunction implies an observation categorial which in turn implies an observation sentence, and because an observation sentence provides empirical evidence for an observation categorial which in turn provides the empirical evidence for the theoretical conjunction, this being a necessary feature of all inquiry, then all research is, in its logical form, hypothetico-deductive.

However, while research has this logical character, in terms of the relationship between the various sentences, it should not be concluded that the actual practice of research must conform to what might be called the hypothetico-deductive method. That is, it would be a mistake to think that all inquiry must, logically must, begin with the formulation of a theoretical conjunction, from which observation categorials are subsequently derived, and observation sentences eventually tested. Research may proceed in this way (as with experimentation), but it need not. Instead, particular observation sentences may lead to their codification as an observation categorial (as with participant observation). Only later may a theoretical conjunction be pieced together which implies the observation categorial. (See Chapter 8) Logically, neither

procedure carries greater weight, although, depending on the state of our theories, the available evidence, and the like, in any particular instance one approach may be more warranted than the other. What is certain is that there is nothing to be gained from researchers debating the merits of one methodological practice at the expense of another in any general sense, for both approaches are logically sound. Rather, one may be more efficacious on some occasions, the other more so at other times.

One important methodological consequence is this. There is no ruling out in advance of inquiry any particular research design or technique. Investigation of an educational issue may employ such approaches as the historical, philosophical and the experimental; it may use existing data such as organizational records or utilize questionnaires, interviews, tests and the like to gather evidence. Whether a particular design or instrument is appropriate on any given occasion will be shaped not only by the subject of the inquiry but also by the extent to which the evidence gathered helps to solve the problem being investigated and contributes to the growth of our theory. The notion that there is but one right research methodology, one right design, one right technique, not only fails to recognize the scope of inquiry but more damagingly places severe and unwarranted restrictions on not only theory generation but also on what evidence can be brought forward for theory testing. There are no epistemic grounds for limiting the growth of theories and few for restricting the procedures for their adjudication (eg. We may see little merit in intuition, clairvoyance and soothsaying as research techniques in the absence of evidence of their success in testing theories). This is not to advocate an 'anything goes' attitude towards research, but it is to advance a view of inquiry which is sufficiently catholic in its scope to admit a variety of research designs and techniques limited only by the criterion of whether they contribute to theory construction and assessment.

The logical structure plays an important role in the testing of theories by laying down the formal elements which must be considered. However, it is only when the principle of holism is applied to the formal hypothetico-deductive fabric of our global theoretical network that certain unavoidable consequences arise for researchers which will govern what sorts of conclusions can be reached about the theories under test. If no single theoretical statement can, on its own, imply an observation categorical, but only a bundle of theoretical statements can do so, then it is evident that while an observation

categorial consistent with a particular observation sentence will continue to support the theoretical conjunction, an observation categorial found to be inconsistent with a non-rescinded observation sentence places the theoretical conjunction which implies it in jeopardy. When an observation categorial is found wanting (eg. If iron is heated it will expand), then the theoretical conjunction (e.g. molecular theory) which implies it itself stands in need of revision if an amended observation categorial is to be implied which is compatible with the observation sentence (e.g. This piece of iron did not expand when heated). There is no logical formula to which a researcher can turn in order to determine which component(s) of the theoretical conjunction should be corrected. A decision on whether the whole or only a part of either the theory under test (molecular theory) or the background auxiliary theories (Setting up the experiment, amount of heat applied to the iron) required to put the theory under test to the test, can only be made on the basis of a pragmatic judgement about the consequences of opting for revision of this part of the conjunction rather than that. And modification of the conjunction will almost certainly also require emendation to those conjunctions which implied it. (See Chapter 8) Now, whether the researcher holds fast to the observation sentence and seeks revision of the theoretical component, or retains the theory by rejecting the empirical observation, the decision taken will necessitate appeal to the supra-empirical virtues to resolve the issue of what to keep and what to dispense with.

Which alternative causes least disruption to the rest of the theoretical network? There would need to be very compelling reasons for seeking major revision of the overall system, or even a substantial part of it, simply on the basis of holding, come what may, to a simple observation sentence (This piece of iron did not expand when heated) contrary to a well-established and well-confirmed observation categorial (Iron expands when heated) and theoretical conjunction. But a number of recalcitrant observations may give researchers good grounds for amending a new and highly speculative theory or an old one that is no longer able to account for the accumulated anomalies (e.g. A metal consisting of iron and a new mineral which, when heated does not expand). However, unless significant gain is achieved by major revision or elimination of current theory, then the virtue of conservatism applies. So too, for example, does the virtue of generality. Which of the alternatives offers the widest scope by incorporating the phenomena under investigation? For someone researching into the administration of

educational organizations, an important consideration will almost certainly be the extent to which the alternatives give full coverage to the empirical evidence. If one option explains more than the others then it has a measure of preference over its rivals. (An explanation limited to the participant's intentions, meanings and interpretations of the principal's behaviour would be less encompassing than one which also attempted to identify the structural aspects of the organization which influenced the principal's conduct even if s/he was not aware of these causal regularities). Likewise for simplicity - one choice rather than another may lead to greater theoretical simplification - the theory with fewer assumptions is preferable to a bloated theory. One revision may lead to simplification while another may not. And so on, as the other virtues are considered, both for a particular theory under test and when rival theories are being adjudicated for their epistemic fitness. (See Chapter 8) Since it by no means follows that all the applicable virtues accrue in favour of any one particular alternative but may be distributed across several, then pragmatic judgements must be made by the researcher as to which virtues are to be given greater weighting, which virtues are to be considered in tandem and which in isolation, whether the revision made will win the support of one's fellow researchers or raise their ire, and so on. In practical terms, all researchers invoke supra-empirical virtues, whether they are aware of it or not. Given the inevitability of appealing to extra-empirical criteria in theory testing and adjudication, it would be judicious of researchers to be cognizant of this facet of their practice in order to arrive at a well-justified judgement about what to revise and why. Naturalized philosophy seeks to do this by making the virtues and the process explicit.

A further implication of naturalized philosophy for research into the administration of educational organizations lies in the procedure to establish what a theory is ontologically committed to. Theories, or theory formulations, of common-sense and systematic research alike, contain a variety of linguistic expression, some referential and others not. To distinguish between the claims of a theory which denote and those which do not, or to separate realist from instrumentalist assertions, we require some way of determining what objects, processes, relationships, and the like a theory presumes to exist. For the lay person it may not matter whether the language of casual conversation refers to anything at all, and for the researcher engaged in everyday talk it may also be inconsequential. But for the researcher, qua researcher, it

certainly does matter a great deal since researchers usually take the idea seriously that their observation sentences and theoretical statements, some of them at least, are not works of fiction but say something about the world. Because ordinary language serves a variety of purposes and tends to be notoriously tolerant of all manner of referential talk ('What is on your mind?') and accepts an expanded ontology (eg. minds, mental states), it fails to provide a satisfactory criterion for determining whether this talk is to be carried over into ontological commitment about what there is. For example, if someone says 'I'm in two minds about that', does this commit the speaker to not only having a mind but having two of them at that! Naturalized philosophy does provide researchers with a procedure for clarifying what ontology a theory about the administration of educational organizations is committed to. To illustrate: It is important to know whether the phenomenological researcher's talk of the participant's intentions, meanings and the like is to be literally construed - that is, are researchers of this persuasion ontologically committed to the existence of intentions and meanings which are denoted by such words as 'intentions' and 'meanings' contained in their empirical theories? Likewise, for instance, of 'systems' in positivist talk and 'social class' in the discourse of critical theorists.

The determination of what a theory is ontologically committed to requires a precise, formal language suited to the task of clarifying exactly which linguistic expressions denote aspects of reality and which do not. Canonical notation is one such language. It sets the logical form of the ontological commitment of theories but avoids presumptions about empirical content. Canonical notation is a procedure governing the way the sentences of ordinary language and science are paraphrased into the language of quantification so that the ontological commitment of our sentences is made explicit. In short, canonical notation converts the referential expression of a theory to variables while that which is denoted by the referential expressions (things in the world) become values of the variables. Hence the formula of canonical notation: 'To be is to be the value of a variable'. (See Chapter 7) Or, to put it another way, a theory is ontologically committed to some x if x is an example or an instance of a variable (referential expression) of a theory (If there is a particular intention, as a thing in the world, which is an instance of the phenomenologist's phrase 'The participant's intention'). A variable which has no values is empty so commands no ontological

commitment.

The advantage to the researcher of having access to the powerful logical resources of canonical notation lies in the opportunity it affords to not only scrutinize the ontological commitment of one's own theories but also to critically examine what ontologies rival theories are committed to. By employing the tools of canonical notation a researcher can, for example, push the phenomenologically-inspired researcher to either affirm commitment to the ontological existence of such entities as intentions and meanings with all the empirical difficulties these entail, or to concede that they are mere instrumental fictions having no causal power in explanatory accounts of the world, or to eliminate such expressions as 'intentions' and 'meanings' from phenomenological theory and intentions and meanings from a phenomenological ontology.

The employment of canonical notation to elucidate the ontological commitment of theories is not without some practical difficulties. Researchers learn the idiom of common-sense early on, and later the theories generated by inquiry are acquired. In both cases, the expressions become so familiar that the stilted language of canonical notation strikes most researchers as rather quaint, if not decidedly odd. Standard English, for example, has variations such as Pidgin English and the grammatically 'incorrect' turns of phrase of youth cultures which are initially strange, indeed incomprehensible, to standard speakers. Once understood, these alternative languages are seen to have a point. So too with the stilted English of canonical notation. (See Chapter 7, footnote 47) What at first jars with our usual ways of expressing ourselves, once grasped, provides the researcher with a powerful analytic tool. Overcoming the initial strangeness of the idiom of canonical notation is the first hurdle. For some researchers, particularly those already using the language of science, the regimentation of such sentences into the idiom of canonical notation is relatively straight forward compared with those researchers who couch their descriptions and explanations in ordinary language. Here, the regimentation of everyday talk, with all its vagaries, into the tightly-structured formulae of canonical notation places far greater demands on the researcher since not only is the translation of ordinary language into the language of notation more forced but it also carries with it the distinct possibility that much of what ordinary language research lays claim to as real will be swept away (eg. minds, mental states, meanings, interpretations, etc). So, researchers employing

common-sense explanations have far more to lose since it is possible that a sizeable portion of their global theory may be revealed to no longer warrant ontological commitment. The consequences of this are a massive theoretical revision if, for instance, intentions, meanings, and the like are eliminated from their ontology (Move from a dualist to a monist conception of persons), along with a significant degree of psychological adjustment if the revision required is the revision of deeply ingrained theories about ourselves as persons and social beings. On the other hand, the potential of canonical notation to make abundantly clear exactly what a theory is ontologically committed to should not be lost sight of, and this insight should probably over-ride a researcher's emotional attachment to a favoured theory, no matter how psychologically irresistible it might be.

Another consequence of naturalized philosophy for research into the administration of educational organizations is this: if the co-evolution of folk psychology and neuropsychology results in the reduction of some version of the former to some version of the latter, what effect will this have on our explanations of the conduct of administrators in educational organizations? For researchers, a starting point in understanding how our global theoretical system develops is to grasp that while the bulk of our theories are complementary with minor additions being regularly incorporated, often major advances only come with theoretical pluralism where rival theories compel researchers to consider their relative merits and reach a decision regarding simple reduction through to complete elimination of one theory by another. Sometimes researchers strike it lucky and are able to achieve a reasonably smooth reduction where the old theory is preserved within the new. More often there is some measure of difficulty in reducing the old to the new so reconfiguration of the old may be expected. Complete elimination of the old by the new may also be required. In some cases a reduction, here and now, is not possible because one and perhaps even both of the theories have not reached maturity. Only later, following a process of co-evolution², may it be possible to achieve any sort of reduction, the outcome being one not presently predictable. (See Chapter 9) And if the researcher is of the view that what is reduced is a matter of ontology, then such an impression should be dispelled: the stuff of the world remains as it is - what changes are our theories of the world where the new theories match the explanatory power of the old without loss while explaining more.

It is more than likely that folk psychological and neuropsychological explanations of human behaviour will continue to evolve, possibly at different rates and perhaps in presently unrecognizable forms. If, and when, a reduction eventuates and the nature of this reduction, remain matters of speculation which provide researchers with little practical counsel. But if folk psychology and neuropsychology, as presently construed, are considered then perhaps something more sensible can be said which offers more direction to research employing neuropsychological explanations of administrative behaviour in educational organizations.

Researchers investigating the administration of educational organizations are usually interested in the conduct of the administrators and those administered. The explanatory emphasis is on the relation between external causal conditions, covert inner psychological states and overt physical behaviour. The common-sense view, shared by phenomenologically and critical theory inspired researchers, holds that folk psychology, in part if not in full, must be invoked to explain this relation. However, if neuropsychology is adopted as the explanatory theory, then folk psychology becomes its first victim. Adherence to neuropsychological theory commits the researcher to not only persuading folk psychologists of the perceived error of their theory but also of demonstrating the advantages of the neuropsychological alternative. The task is challenging because it confronts head-on the cherished conceptions people have of themselves. But if folk psychology is a theory, a theory having explanatory force, then it may be false and, if so, eliminable. So, is folk psychology a theory and is it eliminable? So it would seem. Its concepts are theoretical, it possesses structural parallels with the law-likeness of scientific theories, its propositional attitudes are predicate-forming, and law-like expressions can be generated between propositional attitudes. The generalizations of folk psychology, the bulk of them anyway, are causal and nomological. The propositional attitudes can be used to explain, predict, and control other people's behaviour because a causal chain of empirical regularities is assumed. (See Chapter 9) Further, just as our understanding of the external world is mediated by our theoretical concepts, so too is our introspection of our inner world of psychological states theoretically mediated. We learn about our inner states in the same way we learn about the external world, and our theories about our psychological states are no less immune to revision than are our theories of the things around us.

What, then, can the naturalist philosopher say to the folk psychological researcher in support of the view that the latter's theory is false? Against the criteria of theory evaluation, folk psychology seems to be stagnant rather than progressive in what it explains, it has a limited range of application to what might be called 'normal behaviour' (it excludes mental illness and genius) and it fails to explain that which we all experience - sleep, dreams, reasoning, emotion, creativity and the like. Put simply, folk psychology cannot account for the anomalies which confront it. Further, it lacks coherence with the rest of our theories about the world. These latter theories, being physical theories, give causal accounts of relations between physical states; folk psychology, on the other hand, is an atypical theory since it is about the logical relations between the content sentences of propositional attitudes. Folk psychological explanations of human behaviour rest on a conception of the 'mind' being a sentential computing device. (See Chapter 9) The problem of looking at things this way is that the sentential model seems to fall short of providing an adequate description of administrative behaviour: It posits an unexplained difference between human brains and the brains of other animals and it fails to show how pre-linguistic or non-linguistic learning is possible. If some forms of complex information processing precede language acquisition, and if our sentential resources are more relevant to linguistic communication than cognitive operations, then serious questions should be asked about the adequacy of folk psychology. A first step, albeit a rather limited one at that, in the transition from folk psychology to neuropsychology might consist in no more than a refrain from employing the conceptual apparatus of folk psychology whenever possible. Thus, 'The administrator *intends* balancing the budget this year' can be rephrased as 'The administrator *will try to* balance the budget this year'; likewise for similar expressions - 'I *believe* that the HOD will come to me for more funds' becomes 'I *have been told* that...' or '*It is very probable* that...' and so on. Here, there is a move from the intensional to the extensional, from something about the speaker's state of mind to something about the world. Admittedly, this is only a limited strategy since it provides no explanatory account of behaviour but what it does represent is a redirection of focus away from mental talk to referential talk, from subjective psychological attitudes about things to the objective empirical conditions of these things.

The shift from folk psychology to the conceptual resources of neuropsychology

can be done in one of several ways, that of eliminative materialism being especially noteworthy. Although not yet fully developed, a neuropsychological theory of human behaviour is both progressive in its expanding scope of applicability and coherent with the rest of our empirical theory. The explanatory theories of researchers of what administratively happens in educational organizations are now shaped by hypotheses about the brain and its workings. Explanations of our experience, specifically that of a psychological nature, are couched in purely physical terms as instances of neural information processing. The brain possesses a plasticity which permits learning and incorporates cultural elements: human consciousness is a property of the brain shaped by social relations, social practices, social artefacts, all of which are physically constituted even if culturally produced. That which we call cultural is a set of behavioural dispositions possessed by individuals and shared by others in the social groups to which they belong, these shared dispositions being manifested in shared social practices. (See Chapter 9) The consequences of treating behaviour, brains and culture as material are several - there is a coherence with the rest of our material theories about the world, and the distinction between reasons for actions and causes of behaviour collapses. If we do feel compelled to continue talking of reasons then they should be understood as markers for as yet unexplained causes, but because reasons presuppose both a complex structure of causal regularities between people and their environment and distinct causal mechanisms of behaviour, then researchers might be better advised to avoid 'reasons' talk altogether in favour of causal explanations whenever the opportunity arises.

While research participants may continue to employ the language of folk psychology, researchers researching the administration of educational organizations are not bound by the same constraint. To illustrate how a neuropsychological approach to educational administration might be employed by researchers, the example of decision-making, a topic of interest to theorists and researchers of educational administration both early³ and late⁴, is instructive. In his account of administrative decision-making as pattern recognition and processing, Evers has this to say:

A corresponding analysis of learning to make sound administrative decisions from experience might run, in general terms, as follows. Problem scenes are classified according to some breakdown into

relevant salient features applicable to a range of problems. These features are the elements of an input vector, more like a visual pattern or picture, which is then processed to produce a decision output of expected consequences. A mismatch between expectation and experience drives revisions to processing. We think again, perhaps recognizing some elements as more important than we first allowed, perhaps expanding the vector to cover features we think we overlooked. We make more decisions, learning over time through pressure of persistent feedback from experience. In the end, we may exhibit great skill, effortlessly seeing through complex administrative scenes to some underlying pattern which we immediately associate with a (hopefully) good decision. In this way, a great deal of ordinary, everyday, decision-making comes to resemble pattern recognition and processing rather than the logical manipulation of theory formulations, with an administrator's practical knowledge residing in the relevant weights and geometry of the brain.⁵

Given the state of our current best theories of the brain, our understanding of how administrative behaviour is to be explained remains rather undeveloped. Nonetheless, such an account as just sketched out points researchers in the right direction to generate new theoretical explanations which provide clearer and more penetrating explications of what administrators and the administered do and why.

Finally, the naturalization of values impinges on researching the administration of educational organizations in at least two important ways: the assessment of evaluative reasoning, especially that of an ethical kind, and the implications of this for advice on how educational organizations should be administered.

The realm of values poses a problem for many researchers, especially those who claim that it is one thing to report on the values of research participants by discovering what they value, and quite another thing altogether to subject these to critical evaluation. From the perspective of naturalized philosophy, there is a considerable latitude for the researcher to go beyond empirical concerns to engage in evaluations of evaluations. Values have an innate origin and valuing is connected to epistemology through initial induction over likes/dislikes rising to a sophisticated theory of value learning via the application of prototypical concepts to situations. Our

evaluative talk, such as the expression of moral convictions, is constitutive of the global theoretical network we employ to make our way in the world. In our moral discourse, for example, there are our sensory stimulations connected one way with observation sentences reporting that which arouses our affective sensibilities and the other way with the theoretical language of ethics such as 'good', 'ought' and the like. (See Chapter 10) Because evaluative statements share a common innate origin with empirical statements, both being linked to a mutual set of observation sentences, coupled with the evaluative possessing empirical content, then there seems to be no grounds for supposing that the evaluative can be strictly separated from the empirical. Quite the contrary, the intimate relationship between evaluative and non-evaluative considerations is clearly evident in the way moral concepts and moral language changes as a consequence of new sensory experience, altered empirical understanding and conceptual revision.

One task the researcher can undertake is the analysis of the evaluative reasoning of research participants. Appraisal employs much the same methodological procedures as other forms of reasoning - for instance, inductive and deductive argument, and the application of supra-empirical virtues. In addition, an enlarged conjunction composed of descriptive and evaluative statements leading to a moral conclusion, when put to the test, can invoke the principle of holism to accommodate revision of either the empirical or the evaluative components. It is open to the researcher to scrutinize the logical structure of the participant's argument for inconsistency and omission; beyond this, the researcher can probe the coherence of the argument with the rest of the participant's theory, and more importantly still, challenge the empirical adequacy of the descriptive premises, the merits of the evaluative assumptions, and ultimately, the worth attached by the participants to the various elements of the evaluative argument and the soundness of the conclusion.

The distinction between instrumental and ultimate values provides those who research the administration of educational organizations with a further means of investigating the normative. Many value claims are instrumental since they serve as means to reaching other ends. Instrumental values are causally related to the ultimate ends because they render the achievement of ultimate goals more or less likely. (See Chapter 10) So, to say of honesty, for example, that it is good because it contributes to

the greater happiness and well-being of persons collectively is to ascribe to it an instrumental value, and the extent to which honesty is good can be empirically investigated by exploring whether honesty either enhances or curbs the general happiness and well-being. The researcher should be alert to the instrumental character of many evaluative claims and, given their empirical nature, be willing to subject those made by research participants to closer scrutiny, pointing out when necessary how particular instrumental values fail the empirical test of achieving higher or ultimate ends. The point is, this is an empirical exercise, well within the capability of many researchers to embark upon and with little reason for them not doing so.

Of ultimate values, the question of their justification is not something which researchers of educational administration, qua researchers, have any special expertise in, over and above that possessed by other human beings. Nonetheless, educational researchers do have a legitimate interest in commenting upon the sorts of ultimate values research participants are committed to. If the administration of educational organizations is to consist of more than just routine administrative tasks, if it is to rise above simple managerial matters, then administrators must confront the issue of what makes an organization an *educational* organization. What seems to distinguish educational organizations from other types of organizations is not their organizational and administrative structures and practices which, superficially at least, are somewhat similar, but rather it is the goals or ends which mark out an organization as distinctly educational. What makes an organization educational is its primary focus on learning and teaching, on the transmission and acquisition of knowledge, values, attitudes, skills and the like. Most, if not all, organizations have these features to some degree, but not as their first aim. For them, these facets usually have value only insofar as they contribute to making profits, winning wars, strengthening religious faith, indulging in pastimes, and so on. For educational organizations, on the other hand, their very *raison d'être* lies in educating people, of learning about themselves and their world.

IMPLICATIONS FOR ADMINISTRATIVE PRACTICE

What, then, could a researcher working within the tradition of naturalized philosophy say to those administering educational organizations? Probably many things, but two stand out as especially noteworthy: first, because the demands of holism

placed upon research and practical reasoning, there is not always a strong link between research findings and administrative practice; second, that the educational activities and administrative practices of educational organizations should be consistent with the principles of learning, naturalistically conceived.

The connection between empirical theories and administrative practice is reasonably close at the instrumental level. Our best scientific theories can provide powerful causal accounts of how to promote or impede particular sorts of outcomes - which teaching strategies enhance or hinder a child's learning, which administrative arrangements support or restrict a teacher's pedagogy, which timetabling schedule offers the best integration of curriculum subjects suited to children acquiring unified epistemic understanding, and so on. On these and countless other matters a grasp of relevant causal relations can be employed to facilitate the achievement of explicit goals. As naturalized philosophy extends its reach in providing causal explanations of human behaviour then it will become increasingly more successful in aiding administrators in reaching certain ends. This need not be thought of in any pejorative way - since all human behaviour, on a materialist account, is causal then we have no alternative but to understand our behaviour as causally motivated, causally controlled, and causally consequential. Which causal chains are invoked, and which are not, are further matters which researchers and administrators would need to consider. But on the assumption that all human behaviour is causal, then scientific theories offer the best prospects for our understanding such behaviour and channelling it in certain directions and not others.

How might researchers' empirical insights into the causal nature of human behaviour guide educational administrators in their decision-making about learning, teaching, organization and administration? The matter is far more complex than the simplistic notion that if researchers provide administrators with these cognitive resources then administrators will by virtue of this new learning revise their practice. Where new theories gel with existing theories held by administrators, then new strategies are easily augmented to current practices, so the principle of conservatism prevails. Where new causal stories more efficaciously achieve given ends at the expense of customary practice then administrators can probably be moved to adopt the new and eliminate the old without undue difficulty when the revised practice does not

clash with deeper values. However, when novel theories about administration demand fundamental changes to administrator's conceptions of educational organizations and how they ought to be administered, then there is a crucial role for researchers to participate in the process of theory change and the transformation of practice.

If administrators are to take theory seriously, and if they are to be in a position to use the research findings available to them to inform their practice, then they must learn about the processes of theory construction, evaluation and revision. This is one area where researchers can assist administrators. Theirs becomes an educative task, to encourage a greater awareness on the part of administrators of how theories and research link with administrative practice. This is especially the case where competing ethical theories of educational administration are concerned. At the more applied level of reportive and prescriptive values, researchers can demonstrate how these judgements relate to administrative practice. Reportive evaluations expressing views about what is good convey support for procedures, whether customary or novel, are often instrumental, and they are usually non-binding, being more of an exhortatory character. There is a measure of latitude for administrators to decide whether or not to adopt the commended undertaking since the causally most productive steps to take may nonetheless be morally unacceptable. With prescriptive evaluations about what an administrator ought to do, there is a little less room for manoeuvre. Clearly, if administrators accept the injunction, then they are morally obligated to behave in accordance with the dictate. However, where a moral imperative is rejected, then a researcher may be in a position to offer guidance to the administrator on how to work through the moral conjunction to determine where revision might be made.

With the testing of evaluative theories and claims, researchers may possess some expertise in the matter which could prove beneficial to administrators⁶. In making decisions about what is the best thing to be done, administrators can surely profit from a greater understanding of the decision-making process. A researcher can point out that the practical testing of evaluative theories of educational administration is contained by holism, that from a conjunction of empirical and evaluative claims can be logically deduced a prediction about observable moral conduct which spells out how an administrator will behave in a particular administrative situation, and that we can retain or revise our moral reasoning in the light of compelling empirical evidence. The

researcher can assist the administrator in the latter's learning how to engage in moral observation - observation is theory-laden so moral observation will depend on moral theory, with something being observed wrong according to the observer's concept of wrongness embedded in the moral theory. Our moral theories about educational administration are tested against both our thought experiments, which researchers and administrators can generate, and against our moral observations - specifically, against deontological standards and/or teleological consequences. In the final analysis, the researcher can aid the administrator to revise the moral conjunction supporting practice if the feedback is compelling or retain the conjunction if it is not. (See Chapter 10) This is a pragmatic exercise without appeal to any absoluteness of logical axioms, empirical force or evaluative compulsion which binds an administrator to any one line of behaviour.

On the matter of conflicting ultimate moral ends which impinge on educational organizations and their administration, researchers, not being moral experts, have no special expertise to resolve the conflict. But they are not helpless to intervene either. It is open for a researcher guided by naturalized philosophy to point out to the disputants, whether they be opposing administrators or administrators and administered, that the contrary values may rule out a rational resolution of the disagreement, or that certain views may rely on false empirical claims, or that there are inconsistencies between a disputant's professed moral claim and the rest of that person's values, or that there are harmful consequences of adopting a particular moral stance which the disputant is unaware of. All of these are empirical matters about which those engaged in moral conflict should be made aware of and where someone with the relevant research theory and experience is in a position to inform the sparring parties then they should do so.

There is one last move a researcher committed to naturalized philosophy can make. The researcher can insist that educational administrators adhere to certain sorts of values. First, educational organizations should conform to the values required for there to be social life, and for there to be social organizations. Just as the universal moral principles of promoting justice, succour and honesty and minimizing harm are necessary for social existence, so too are these very same values vital to the life of educational organizations. (See Chapter 10) There would be something odd about an educational organization setting out to eliminate the very values mandatory for its

survival. Second, and perhaps more importantly, a researcher working within the tradition of naturalized philosophy is able to point out how the values of learning and inquiry should be the values of teaching, administration and researching. Learning requires at least the following: promotion of the growth of theories, advancement of their widest dissemination, guarantees of freedom to generate theories and to test them, fostering autonomy to take the best theories as one's own on the basis of rational argument and evidence, and the championing of democratic procedures to facilitate further learning. Since educational organizations have, as their primary focus, the promotion of learning, then it follows that not only should the general principles of learning be firmly fixed in place in such organizations, but also that educational organizations should be structurally put together and administered in a manner which both promotes these values and best provides for the learner's learning of them, whether the learners be children, teachers, administrators, even parents. These are empirical matters about which some of those researching the administration of educational organizations might be well-informed. Where so, it behoves the administrator to pause carefully before rejecting what such a researcher might have to say.

The purpose of an educational organization is to promote learning - the learning of theories, the learning of knowledge, the learning of values, and the learning of the sort of society conducive to the democratic ideals which sustain such learning. There is, in the end, no epistemic difference between the learner's learning, the teacher's teaching, the administrator's administering and the researcher's researching. All are working on problems, all seek plausible solutions, all put them to the test and revise them accordingly, and all appeal to our theoretical system to do so. Different problems, different solutions, different levels of complexity; but for all of them the same fundamental process, directed not at problem solving and the growth of knowledge for its own sake as an ultimate end but rather at developing and enhancing our conceptions of, and the material conditions necessary for, the continuing advancement of human flourishing and well-being.

IMPLICATIONS FOR THE ADJUDICATION OF RIVAL RESEARCH TRADITIONS

Research into the administration of educational organizations is characterized

by a number of competing philosophical traditions of inquiry: logical positivism and its later neo-positivist versions, phenomenology, critical theory, the first stirrings of postmodernism,⁷ and naturalism stand out as the most significant candidates. Over the years since the rise of the theory movement in the early 1950s, the allegiance of researchers to these competing traditions has been a shifting one. Initially, out of the atheoretical conditions of naive empiricism, logical positivism emerged as the first explicit philosophical position to attract a substantial following of theorists and researchers, as well as administrators. The phenomenological alternative burst upon the scene with vigour and excitement, although today it has taken its place as one among many. Critical theory widened the debate by embracing elements of both positivist and phenomenological theory but also transcending them. Naturalized philosophy has sought to re-establish a scientific, albeit non-positivist, account of inquiry. The competition between these philosophical traditions is by no means over as is clearly evident from the continuing debates in the literature. Furthermore, new philosophical traditions such as postmodernism seem destined to enter the fray. The argument has been joined from all sides: Griffiths and Greenfield against each other, Bates against both, Evers and Lakomski against them all and the rest against them. While the resulting dialogue has often made for controversial reading as well as producing a raft of captivating theoretical insights into how the administration of educational organizations ought to be researched, the question of how these competing philosophical theories of inquiry are to be judged remains largely unanswered. Naturalized philosophy provides one solution to the problem of theory competition in educational administration research.

When confronted with a range of competing philosophies of inquiry, a researcher needs to have a set of criteria against which these rival theories can be assessed if relativism or irrational choice are to be avoided. Because naturalized philosophy advocates a set of criteria universally applicable to theory adjudication, such criteria apply to determining the worth of competing philosophical theories of research in educational administration. It should be noted that the criteria, such as they are at this moment in time, are not arrived at in an a priori fashion nor by conceptual analysis. They are the outcome of ongoing empirical inquiry, the best we have at the time, and revisable in the light of further learning. But, being the best we have, we have no

alternative but to employ them in the absence of anything better. The criteria are none other than the supra-empirical virtues of normative naturalized epistemology (See Chapter 8):

(1) **Conservatism:** the philosophical theory which coheres best with the rest of our theoretical system, causing the least disruption to the network as a whole, is to be preferred. A philosophical theory at odds with established empirical theory is very unlikely to do well at the cost of extensive revision to the theoretical network. Phenomenology, for example, runs into difficulty here.

(2) **Modesty:** one philosophical theory is more modest than another if the former is implied by the latter but does not imply it. For example, it might be claimed that phenomenology is more modest than critical theory since critical theory captures much of phenomenological thought which is not reciprocated by the latter. A modest, embedded theory fails to explain as much as a more encompassing, embedding theory.

(3) **Precision:** a precisely stated philosophical theory contains well-defined terms which specify what the theory is ontologically committed to. Theories with fuzzy expressions, as with phenomenology and postmodernism, fare poorly in this regard.

(4) **Generality:** the more unified our system of theory the more content which is brought under its cover. Although positivist and phenomenological theories are relatively unified due to their limited scope, they do not possess wide generality since each excludes the content of the other. Critical theory, however, has greater generality but, because of its partitioning, this is at the expense of epistemic unity.

(5) **Simplicity:** the simplest philosophical theory is the one which, compared with its rivals, covers as much as or more than they do with fewer assumptions. Although logical positivism and phenomenology contain fewer assumptions than critical theory, by comparison they also cover far less. On the other hand, the extended coverage of critical theory brings with it an expanded, not a simplified, logical structure.

(6) **Parsimony:** Theories which posit more unobservable entities to account for things are less parsimonious than those positing fewer. Logical positivism did reasonably well in this respect while phenomenology (positing propositional attitudes and meanings) and critical theory (positing cognitive interests) are less parsimonious.

(7) **Fecundity:** a philosophical theory which can be extended to encompass new evidence is preferable to one with limited potential for development. Logical positivism

and phenomenology, being more restricted in scope, are less fertile than critical theory which is more encompassing.

(8) Refutation: philosophical theories, like all theories, are revisable and eliminable. However, philosophical theories which claim to be foundational quarantine off a portion of theory as beyond refutation. Such is the case with logical positivism (observations), phenomenology (meanings and interpretations) and critical theory (cognitive interests). The problem is, there seems to be no epistemic grounds for exempting a part of theory from possible revision.

(9) Robustness: robust theories are those which have withstood the force of repeated testing. Within educational administration research, logical positivism and phenomenology have not done well in this regard: logical positivism has suffered because of its impoverished account of science, phenomenology because of its relativism. While no philosophical theory is immune from criticism, some theories perhaps emerge from criticism in slightly better shape than others (eg. critical theory).

Against these criteria, naturalized philosophy does reasonably well in comparison with its rivals. It coheres with the bulk of existing theory about the world. Like critical theory, it is less modest than its competitors. Unlike them, it places a premium on precision of ontological commitment. Generality is achieved through materialist unity. Compared with other theories, naturalized philosophy appears to contain fewer assumptions but also does well with coverage. It is also parsimonious in the positing of unobservables - being limited to material posits, an eliminative version of naturalized philosophy disposes of the problem of accounting for puzzling entities such as propositional attitudes and cognitive interests. It displays all the signs of being empirically fertile - the advances in neuropsychological explanations of human behaviour appear to be opening up promising avenues for new empirical discoveries as well as for reconceptualizing philosophy. Being non-foundational, naturalized philosophy accepts without reservation its own fallibility, placing no part of itself beyond the reach of revision or even complete elimination. As for its robustness, naturalized philosophy in the hands of Evers and Lakomski has to date held up well, coming back with forceful counter-arguments to the criticism levelled against it.

So far, naturalized philosophy has made good progress in carving out a respectable, and highly respected,⁸ place for itself in the debate about philosophical

theory in educational administration research. Whether it will ever supersede its rivals remains, as always with theory competition, an open empirical question. However, its long term prospects for doing so, as this thesis has sought to demonstrate, look reasonably promising.

NOTES

- 1 The evidence for our whole system of theory is sensory evidence - our observations, one's own and the accumulated mass of many. Such evidence as there is consists of two sorts: (1) There are our own direct observations of verbal and non-verbal behaviour. We tend to place a high degree of confidence in the correctness of our own observations, especially on those occasions of shared affirmation by all those witnesses present, of an observation sentence which reports one's own observation. And researchers are no exception, placing greater confidence in their own observations and observational reports. (2) There are our direct observations of other people's reports of verbal and non-verbal behaviour. But for the researcher, as for everyone, someone else's report of events does not have the same status as one's own observation report. While a researcher may have good reason to trust the report given by a participant of what s/he or another said or did, it is evident that in accepting the report the researcher is accepting it on the basis of other observations which are not his or her own. In some instances the connection between observation evidence and acceptance of the speaker's report by a researcher may be only once removed. But on some occasions the linkage may be very tenuous and much removed as in cases where the participant reports what others report and the researcher's report of a report of a report is read by someone else. What the researcher observes is the spoken or written report itself; the veracity of the report ultimately rests on the observational evidence of the reporting participant and not of the researcher, and a researcher's acceptance of a participant's report of verbal and non-verbal behaviour will depend on how far the participant's word can be trusted. After all, the participant witness reporting an event may forget some of the details, fail to notice relevant aspects at the time, and so on.

In the reporting of observations, a distinction can be drawn between direct and indirect observation: whereas a direct quotation objectively reports exactly what was uttered and stands as an objective description of the utterance, indirect quotation is more subjective since the report, couched in such terms as 'says that' reflects a projection of what the speaker or writer 'had in mind'. Indirect quotation in the standard form 'says that' is subjective once over insofar as it interprets what was said. The evidence for indirect quotation is the direct quotation. But other expressions such as 'believes that' are subjective twice over. While 'said that' is limited to verbal behaviour, the propositional attitudes go beyond the speech to assume subjective mental states.

Furthermore, the relation between a researcher's account of events and those of the participants is shaped by the level of description. Where there is a close link between a sentence and a non-verbal stimulation then there will be little divergence in reports of what was observed. The further a sentence strays from the experiential edge the greater the chance of disagreement. As dissident lay observers and researchers move away from theoretical sentences towards observation sentences, the closer they come to agreement on matters. We can

all revert back to observation sentences in times of more abstract theoretical debate since observation sentences will generally secure agreement among researchers and participants alike.

- 2 Walker (1991, 518-9) points out that in the absence of fully developed theories, co-evolution seems a reasonable course of action for researchers to pursue by fastening on to existing practices of co-evolutionary research and to foster a co-evolutionary framework until such time as a reduction is possible.
- 3 Griffiths, 1958.
- 4 Evers, 1994b.
- 5 Evers, 1994b, 272. In a similar vein, Walker (1991, 516) had this to say:

Evers (1990b) has pointed out that there could be a vast dividend for educational theory if learning and cognition are matters of pattern recognition, pattern association, and pattern processing Since the brain is an enormous pattern associator, it is possible that such people have looked into its 'machine language' for 'direct processing'. The truly extraordinary possibility is that one day we might be able to devise a pedagogy that allowed people's learning to access more directly the actual pattern processing features of brains, or restructure curricula to reflect key patterns in knowledge so that learning within and between traditional subjects is driven by considerations of pattern association.

- 6 The idea that researchers can be experts has been challenged by Littrell and Foster (1995, 34-5) who argue that the notion of administrators (and researchers) being so-called 'experts' is a moral fiction because the kind of knowledge required to sustain expertise does not exist. They claim that the social and administrative equivalent of a physics of administration is not attainable because the social sciences lack any kind of predictability. If a science is to have any legitimacy then it must be able to assert that under conditions 'C' a certain outcome 'O' will happen. Their view is that the social sciences cannot do this. They consider that if the social sciences cannot approximate the lawlike generalizations demanded of other sciences, then their status as a science is seriously undermined.

In response, it should be noted that Littrell and Foster's target is positivist science in educational administration. Their attack reveals no awareness of any nonpositivist conceptions of science, particularly that account proposed by Evers and Lakomski (1991) whose book was published four years earlier and whose writings have attracted considerable international attention. Littrell and Foster make a number of claims which, from the perspective of naturalized philosophy, are plainly wrong. Researchers and administrators can, and often do, possess knowledge and theoretical understanding of causal relations central to administration; some of them, at least, could rightly be deemed experts; prediction of human behaviour underpins knowledge of our own and other people's behaviour; social science researchers and administrators often get

their 'If-then' causal predictions right; and the social sciences are quite capable of generating lawlike generalizations on a par with those of other sciences. The whole thrust of this thesis has been to demonstrate that naturalized research into the administration of educational organizations has high standing as a science.

- 7 Willower (1994, 16) points out that postmodernism has not yet had a noteworthy impact in the literature of educational administration. However, given the growing influence of postmodernism in other branches of educational inquiry, it is likely that this particular philosophical tradition will in due course become more influential in educational administration.
- 8 Evers and Lakomski's (1991) book *Knowing Educational Administration* has become the topic of some debate. The journal *Educational Management and Administration* (1993, 21(3)) devoted a whole issue to it, soliciting contributions from Bates (1993), Evers and Lakomski (1993a, b), Gronn and Ribbins (1993), Hodgkinson (1993), Ribbins (1993) and Willower (1993). There has also been an exchange in the *Journal of Educational Administration* (1994, 32(4)) between Maddock (1994) and Evers and Lakomski (1994). A high level of respect for their work is evident in their invited address (Lakomski & Evers, 1995) to Division A (Administration) at the American Educational Research Association annual meeting.

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