

THE KNOWING SUBJECT

A Philosophical Study with Special Reference to the Contribution
of Jean Piaget

1 : THE PROBLEM IN HISTORICAL CONTEXT

1.1 INTRODUCTION

1.1.1 The Aims of This Study

There are three closely related aims to this study:

- 1: To examine carefully the contribution of the epistemology of Jean Piaget in dealing with the problem of the knowing subject.
- 2: To compare the Piagetian contribution with the contributions of philosophers in the contemporary English-speaking world, concentrating on the contributions of Karl Popper and Michael Polanyi with more limited references to Paul Feyerabend and Max Deutscher.
3. To offer a critical evaluation of these various contributions in the context of the development of the outline of an alternative theory of knowledge.

Without attempting a watertight separation, section 2 will be concerned primarily with the first of these three aims, section 3 with the second and section 4 with the third.

1.1.2 Research Background

In so far as Piagetian epistemology has a major part in this study it suggests links with my earlier study (1982) of the work of Jean Piaget. And, indeed, the recognition of the significant, but neglected, contribution of Piagetian epistemology with regard to the role of the knowing subject gained from the earlier study was a significant factor in the decision to pursue the implications of that contribution in the present study. However, the two studies, though having this

link, represent two quite distinct research projects with quite different foci and aims.

The focus of the earlier study was the epistemology of Jean Piaget with special reference to the role of logic; the epistemological issues discussed were such as arose directly from this study of Piagetian epistemology.

The focus of the present study is the problem of the knowing subject as this problem has been treated in recent epistemology. It is not a study in Piagetian epistemology, though that epistemology figures prominently in it, but a study of a specific epistemological problem in a wider epistemological context.

Piagetian epistemology is included because of the significance of its contribution to the consideration of this problem in the context of contemporary epistemology. Because it has been generally neglected, and in my view poorly understood by philosophers especially in the English-speaking world, it receives special attention and more extended treatment than the other contributions considered in order to ensure that its contribution is well understood.

The treatment of Piagetian epistemology in the present study is in no sense a recapitulation or reworking of the earlier study but represents the results of fresh research based on extensive further study of relevant texts, both primary and secondary, together with two months research and discussions at the Centre international d'Épistémologie génétique and Fondation Archives Jean Piaget attached to the University of Geneva. A comparison of the bibliographies will indicate the much wider range of texts that have been consulted for this study. Therefore, while it inevitably touches the themes of the earlier study in places, the presentation in the present study provides an entirely fresh treatment of Piagetian epistemology. On some points, which I have endeavoured to note at the appropriate places, this has led to a

revision of the conclusions of the earlier study.

In the present study the Piagetian texts, both primary and secondary, have been consulted, in every case, in the language of original publication to ensure greatest accuracy of understanding. The English translations that I have used to facilitate the smooth reading of the text of this study are, for the most part, my own. I have added the French original where it contains an important nuance difficult to capture in translation.

1.1.3 The Special Importance of a Systematic Historical Orientation

As an introduction to the study of the problem of the knowing subject in 20th century epistemology I propose to sketch an historical outline of the treatment of this and related problems in Western philosophy, beginning with Plato. In the circumstances this can be no more than an outline drawn in bold lines.

The purpose of this historical outline is to identify various typical approaches to the basic problems involved that can provide a systematic framework for understanding and evaluating the various contemporary contributions that will be studied. Such a framework is important, I suggest, for achieving critical penetration and "objectivity" in such an evaluation.

In the absence of such a systematic historical orientation philosophical thought tends to be enclosed within the canons of the particular systematics with which the philosopher works and which are accepted as "orthodox" by the philosophical community to which he belongs. The conceptual framework and problem formulations endorsed by these canons, are taken without question as universally normative. "Genuine" philosophical problems and "acceptable" philosophical argument are taken to be such as conform to these canons. Philosophical discussion outside this closed circle, so far as it is noticed at all, is trans-

posed into the conceptual framework of the prevailing orthodoxy (a transposition that commonly changes the meaning of the ideas discussed) and its worth is judged by its relevance to problems formulated within that framework.

In this situation philosophical discussion may be vigorous and penetrating within the canons of this prevailing orthodoxy but those canons themselves, which set the fundamental terms of the discussion, are seldom critically scrutinised and evaluated. Deutscher (1983:253-259) discusses such a tendency in 20th century English-speaking philosophy, though, in my view, he does not give adequate attention to the significance of the lack of a systematic historical orientation in relation to that tendency.

Of course a systematic historical orientation does not of itself guarantee critical openness and "objectivity" in philosophical discussion. Historical studies themselves may be enclosed within a closed philosophical system that systematically presses all philosophical thought within its own conceptual framework so that the historical studies only serve the purpose of reinforcing the assumptions of the system.

An historical orientation that facilitates a more penetrating philosophical critique must be the result of an investigation that, on the one hand, empathetically endeavours to understand the work of each philosopher or group of philosophers on its own terms, within its own conceptual framework, distinguishing clearly the various positions that have been adopted; and, on the other hand, sets out to trace systematically the connections and interactions between the positions so distinguished, identifying common problems underlying the diverse problem formulations and typical patterns connecting the diversity of solutions.

A systematic historical orientation of this kind opens the way to a

more penetrating philosophical critique by providing a broader frame of reference for critical evaluation. So far as such an historical orientation is taken seriously the philosopher can no longer merely assume the universal normativity of his own systematics. This systematics, together with any other being evaluated, is placed in the context of interacting alternatives, with alternative conceptual frameworks and alternative formulations of common problems. It is a context in which the interaction of alternatives is not frozen a-historically in the present but is placed within the perspective of historical interactions around common philosophical problems.

It is no longer the philosopher's own systematics, or that of the philosophical "school" to which he belongs, but the broader historical context of philosophical discourse that provides a frame of reference for genuine philosophical dialogue and critical evaluation. In this important sense philosophical discussion becomes more objective.

This is not to suggest that a systematic historical orientation will lead to philosophical discourse that is "objective" in the sense of conforming to subject-independent standards. Such discourse is, in my view, impossible since any standards that may be set are set, in one way or another, by subjects, albeit with reference to a subject-independent reality. Even a systematic historical orientation such as is proposed must be established by a philosophical subject working within a frame of reference that is wider than the resultant historical frame of reference. What is claimed is that, by setting philosophical discourse within an historical frame of reference, a systematic historical orientation of the kind described enables the philosopher to engage in a critically penetrating analysis with a breadth and depth that cannot be achieved without it.

In the pages that follow I hope to provide this kind of historical orientation for the subsequent discussion of the problem of the know-

ing subject, and related problems, in contemporary epistemology. This is given special importance by the second of the three aims of this study, the comparison of Piagetian epistemology with contemporary epistemological thought in the English-speaking world.

At first sight there seems to be no basis for such a comparison given the disparity in the problems being addressed. The situation seems to be like trying to compare research on the syntax of the English language with research on the process by which a child learns to speak English. In such a situation there may be a measure of overlap between the two areas of research such that researchers in one area may benefit from a study of the results obtained in the other area but there can be no question of a comparative evaluation of the two results since they address two quite different problems.

It is in just this way that Piagetian epistemology, when taken seriously at all, has generally been viewed by philosophers in the English-speaking world. Philosophers such as Hamlyn (1971), Toulmin (1971) and Kitchener (1980) discuss Piaget's work in a way that views it, primarily at least, as psychological research addressing psychological problems that is of interest to philosophical epistemology but dealing with problems distinct from those of philosophical epistemology. Piaget himself provides support for this view by his claim that the epistemology he developed is a scientific and not a philosophical epistemology (See section 2.1.6 below).

Nevertheless it is my contention that this view of Piaget's work is mistaken. That he developed an extensive program of psychological research as an indispensable source of data for the development of his epistemology is beyond question. It is also acknowledged that he adopted a method for the development of an epistemology that is not the customary method of philosophical epistemology. However the fundamental problems with which he was concerned were not psychological

problems but epistemological problems identical with problems customarily addressed in philosophical epistemology.

Piagetian epistemology and philosophical epistemology in the contemporary English-speaking world have substantially different agendas for solving the problems but the fundamental problems being addressed are the same. The difficulty is that the widely differing agendas, with their widely differing problem formulations, not only obscure this common concern with common problems but, more importantly, make it difficult to see how the results obtained by following one agenda can be compared with those resulting from the other agenda.

By placing these differing agendas in a wider historical frame of reference we can overcome this difficulty. The widely divergent problem formulations, reflecting divergent philosophical developments in the 19th and 20th centuries, are seen to converge in a common philosophical tradition with common problems and the divergence is put into perspective as a divergence in the way of approaching these common problems.

At the same time it becomes impossible to sustain the illusion that one of these agendas can claim a privileged place as the representative of the historical mainstream of philosophical thought, with the other dismissed as an aberration. We shall find that each has equally sound historical credentials, each representing a modern version of a way of approaching the basic problems that has a respected place in the Western philosophical tradition reaching back to ancient Greece.

Within this perspective the differing approaches, with their differing agendas, can be brought together in fruitful, critical interaction without losing the distinctive character of either one by conflating it with the other.

1.2 IDENTIFYING THE CONTOURS OF THE PROBLEM

Before developing this historical orientation it is important to develop further the contours of the problem to be investigated. For this purpose I begin with certain problem formulations offered by Karl Popper to highlight what he sees as his decisive divergence from his predecessors with regard to the central epistemological problem.

I begin with this not because I take the Popperian discussion as definitive but because it offers a starting point in philosophical discussion in the contemporary English-speaking world that illustrates well the way in which a divergent problem formulation can obscure a convergence in an underlying common problem or problems. On careful analysis the divergent formulations of problems prove to be steps in developing answers to a common basic problem.

From this starting point the main contours of the epistemological problem, and the related subsidiary problems that will provide the focus for this study, will be developed.

1.2.1 The Justificationist Problem

Popper (1983:18-28) claims that the central problem of the philosophy of knowledge, at least since the Reformation, has been the question: "How can we adjudicate or evaluate the far-reaching claims of competing theories and beliefs?" This, he says, has led, historically, to a second problem: "How can we justify our theories or beliefs?" He claims to have made a decisive break with this tradition by rejecting the second problem as irrelevant and, with this, denying the assumption that leads from the first problem to the second.

In Popper's discussion of this it is not easy to distinguish what he is presenting as his own ideas from the presentation of ideas about his position expressed by W.W. Bartley, III in conversations with

Popper. However, as he gives us no way of disentangling Bartley's views on this matter from his own but rather appears to adopt Bartley's views as his own, it is not unreasonable, for the purpose of the present discussion, to treat Popper's presentation as a presentation of his own ideas as illuminated and developed in his discussions with Bartley. In the following discussion, therefore, I shall refer to these views simply as Popper's views

As befits his purpose, Popper has formulated the problems in a way that highlights the divergence between himself and others because he believes that a failure to see it clearly has frustrated rational discussion by providing a persistent source of misinterpretation of his theory. He may well be right in this belief but the obscuring of the underlying convergence that results from this strategy may equally frustrate rational discussion.

If I see only the theoretical differences between myself and a critic of my theory it is unlikely that I will accept his criticisms as relevant to my theory. They are most likely to be regarded as arguments based on his own divergent theory and, since I reject the premiss - the critic's theory - I will reject, on good logical grounds, the conclusion - the criticism of my own theory.

Rational discussion, and mutually beneficial rational criticism, requires some common ground for the discussion and criticism. This does not mean that rational discussion can occur only within a common theoretical framework. It is saying only that there must exist areas on which there is agreement, explicit or implicit, between the parties to the discussion. It seems clear, for example, that rational discussion between two parties will lead nowhere if one party denies all value to rational discussion, unless, of course, some other agreed basis can be established for the discussion. It seems equally clear that, given agreement about the value of rational discussion, the

discussion will be futile unless there is some agreement on a problem, or problems, to be discussed. There is little hope of rational discussion between two people, one of whom wants to discuss the problem of little green men on Mars while the other wants to discuss the problem of a lost tribe of pygmies in Africa, unless, of course, these two problems can be shown to converge in a third problem common to them both.

As we examine Popper's two central problems more closely it is evident that the second embodies a specific answer to the first. It presumes that the answer to the first problem is: We adjudicate between competing theories by admitting only justified, or at least justifiable, theories. It is only after this answer has been given to the first problem that the second problem can arise. Popper rejects the second problem as irrelevant because he rejects the answer to the first problem presupposed by the second problem.

The first of his two central problems thus appears to be a point of convergence between Popper's position and justificationist theories. The divergence, it seems, results from divergent answers to this common problem. But this apparent convergence is brought into question by Popper's claim (1983:19) that his solution to the first problem is not merely a particular answer to that problem but changes the structure of that problem completely.

Popper is not explicit about how the structure of the first problem is changed by his solution. After a swift rejection of the assumption that leads from the first problem to the second the ensuing discussion is occupied wholly with the second problem now called the central problem. Popper's solution is said to have not merely displaced the second problem from the central position but to have replaced it altogether with a new problem, the problem of criticism. All this, however, including the rejection of the assumption leading from the

first problem to the second, concerns the divergence in the solution to the first problem rather than any change in the structure of the first problem. The assumption leading from the first to the second is itself the first step in the justificationist solution to the first problem.

It seems that the change in the structure of the first problem that Popper claims has been produced by his solution is not a change in the internal structure of that problem but the removal of a tacitly assumed connection between the first and the second problems. The argument appears to be that previous epistemologies have tacitly assumed the second problem as an intrinsic component of the first rather than as the first step in an attempted solution of the first. Such a view explains why, after introducing the first problem as the central problem with the second flowing historically from it, all the ensuing discussion treats the second problem as itself the central problem. The argument appears to be that, historically, the first and second problems have been taken, mistakenly, to be logically one problem.

Popper's solution to the first problem, therefore, is said to change its structure by denying the assumption of previous epistemologies that it entails the second problem. As a result it is argued that Popper's solution diverges from all previous epistemologies, rationalist, irrationalist and sceptical, by introducing a new central problem that replaces the problem that all had previously taken as central. Popper alone has escaped the domination of the pseudo-problem of justification (Popper, 1983:21).

The divergence between Popper and others is thus made to seem complete. Yet, when we look more closely the basic problem remains the same for Popper as for the justificationist: How are we to evaluate knowledge claims? In this basic problem all serious epistemologies converge. The claim that Popper has changed the structure of the

central problem obscures the fundamental convergence with justificationism in this common basic problem. As we examine this problem further we find that it divides into two distinct, but interrelated problems: The problem of evaluative criteria and the problem of intersubjective universality.

1.2.2 The Problem of Evaluative Criteria

For Popper, and also for Piaget, the chief concern of epistemology is scientific knowledge. Neither denies that there is knowledge other than scientific knowledge but each maintains that the problems of a theory of knowledge can be resolved satisfactorily only by a study of scientific knowledge.

Underlying this emphasis on scientific knowledge as the object of epistemological investigation is the claim of universality attaching to scientific knowledge. H.A. Prichard's claim (1950:87) that an assertion of which I am certain but which is widely disputed by others remains an assertion of genuine knowledge may be worth considering in a general theory of knowledge but it will not serve as a criterion for evaluating scientific knowledge claims. For this we need intersubjective criteria for evaluation.

A central and persistent epistemological problem in the history of Western thought has been the identification of universal epistemic criteria. It is their continuing interest in this problem within the modern context that leads modern thinkers like Piaget and Popper to focus epistemological attention on scientific knowledge as the paradigm of universal knowledge.

There are two parts to the requirement of epistemic universality. On the one hand, knowledge must fit universally the human experiential universe - the problem of evaluative criteria - and, on the other hand, the tests for this universal fit must be such as to satisfy all rational subjects - the problem of intersubjective universality.

We might rephrase this by saying that knowledge must pass tests for universal empirical truth such as are acceptable to all rational subjects. However, while an instrumentalist would balk at the testing of scientific theories for truth value, even on an instrumentalist account theories must fit the experiential universe in some sense in order to be useful. The formulation of the problem in terms of a fit between the knowledge claim and the experiential universe, therefore, best satisfies the requirement of a convergent problem common to all theories of knowledge that are concerned with the problem of universality of knowledge.

When Popper, in formulating what he calls the first central problem, speaks of evaluating the claims of competing theories, therefore, whatever else such claims may involve they will always involve claims to a consistent fit with the human experiential universe. Any evaluative criteria must include, or presuppose, an answer to the fundamental question: What constitutes an acceptable test of the fit between the theory and the human experiential universe?

It is in the solution he offers to this problem that Popper diverges from previous theories of knowledge in the immediate past of the tradition within which his thinking was developed. Whereas others looked for tests that test for an exact, definitive fit, Popper asks only for tests that test for an approximate, provisional fit; whereas others demanded the best possible fit, Popper asks only for the fit that all things considered in the present circumstances is the preferable fit. In truth value terms he substitutes the criterion of best approximation to the truth for that of absolute truthfulness.

At the same time he shifts the emphasis from the testing of a theory for the adequacy of its fit with the experiential universe to the testing for inadequacies; he shifts the evaluation from testing for empirical truth to testing for empirical falsehood.

All this is no doubt a significant divergence from the mainstream of previous epistemological thought. Nevertheless it converges with that mainstream in the basic problem: What constitutes an acceptable test of the fit between the knowledge claim and the human experiential universe?

It should be noted carefully that the formulation of this first basic problem embodies no presupposition as to the nature of the experiential universe or its relation with human knowledge. It does not, for example, presuppose the experiential universe as a body of data to which knowledge must correspond or as a pre-ordered universe to which knowledge must conform. The experiential universe may just as well be an irrational universe susceptible to being ordered by a rational structure supplied by human thought. In this latter case the test for the fit between the theory and the experiential universe will be a test for the success of the theory in rationally ordering the experiential universe rather than a test for its success in giving account of an already ordered experiential universe.

The basic problem that we identify with this formulation is a bed-rock problem in which all theories of knowledge that give a positive account of scientific knowledge converge.

1.2.3 The Problem of Intersubjective Universality

Closely linked with this first basic problem is the second problem: What is the basis for intersubjective agreement in the testing of knowledge claims?

The dominant view in the Western philosophical tradition has founded this intersubjectivity in a universal and self-authenticating rationality common to all subjects which, if isolated from all non-rational elements, will ensure intersubjective agreement. On this view, scientific knowledge is universal not only in the sense that it has a

universal fit with the human experiential world but also in the sense that it commands the universal assent of all rational subjects.

This leaves the problem: How does this universal, self-authenticating rationality function to secure universal intersubjective agreement? About this there is no consensus commanding universal assent even among rationalists. Popper has given one possible answer by proposing that it functions by rational criticism leading not to truthfulness - as has been most commonly assumed by rationalists before him especially among those whose ideas form the immediate background to his own thought - but to relative truthlikeness.

A feature of epistemological discussion over the past thirty years or so has been the prominence of theories of knowledge that, instead of attempting a new solution to the rationalist formulation of the problem of intersubjectivity, have challenged the rationalist assumption itself - i.e. the assumption of a self-authenticating universal rationality. Yet, so far as they wish to maintain the value of scientific knowledge as intersubjective knowledge, these also have had to deal with the problem of the basis of intersubjective agreement in science. Michael Polanyi, for example, arguing for "the fiduciary rootedness of all rationality" (Polanyi, 1962:297), abandons the attempt to ground the intersubjective universality of scientific knowledge in a self-authenticating rationality. He does not, however, dismiss the basic problem as irrelevant. He offers (Polanyi, 1962: 308-316) a non-rationalist solution by arguing that intersubjective universality is secured by the bi-polar structure of a shared commitment the impersonal pole of which gives to scientific activity a common universal intent.

There is probably no more thoroughgoing example of an "irrationalist" reaction to rationalist theories of science that still gives a positive evaluation of science than that of Paul Feyerabend. Feyer-

abend (1975:224-285) argues for a doctrine of incommensurability that leaves us with a plurality of scientific theories with, in some cases at least, no possible basis for comparative evaluation. Refutations and measures of truth value that are applicable within one theory are not applicable to the other and there is no possibility of any independent standard against which both can be measured. Given this situation even the internal refutations that are possible are quite weak.

This incommensurability is inevitable not by reason of any logical necessity but because scientific theories are logical systems occurring within the context of "comprehensive cosmological points of view" that rest, in the final count, on "aesthetic judgments, judgments of taste, metaphysical prejudices, religious desires", in short on "our subjective wishes" (Feyerabend, 1975:284-285).

Yet even Feyerabend with this doctrine of the incommensurability of theories, while challenging rationalist bases for intersubjective agreement and denying that intersubjective universality is intrinsic to science, does not dismiss the problem as meaningless. Feyerabend (1965:216-218; 1975:295-309; 1981:238) proposes intersubjective tests to be used for making practical decisions between incommensurable theories the application of which depends, it appears, on an intersubjective agreement whose foundations are extrinsic to science. His solution may be challenged, of course, as it has been (e.g. Suppe, 1977:170-180, 636-643) but there seems no doubt that he takes seriously the basic problem; so far as a self-confessed "flippant Dadaist" (Feyerabend, 1975:21n) may be said to take anything seriously!

The problem of the intersubjective universality of knowledge, then, is a second basic problem in which all the main lines of epistemology converge. Whereas rationalist solutions find the solution is a rational necessity of some kind, irrational solutions are founded in some form of intersubjective consensus.

In this connection Popper misses the point when he argues, following Bartley's suggestions, that all sceptics and irrationalists have adopted these positions because they have assumed that the fundamental question is the question of justification - a question that Popper regards as a pseudo-problem. The implication is that if they had only understood Popper's own position they would have had no need to abandon rationalism (Popper, 1983:21).

It appears more likely that they have been driven to their positions by the persistent failure of rationalism to deliver the goods with regard to the basic problem: How is the intersubjectivity of knowledge secured?

Operating on rationalist assumptions it should be possible to produce a solution to that problem that will command the assent of all rational subjects. The failure to do so after centuries of persistent attempts, including the failure of Popper's own solution to command universal or even near universal assent even among rationalists, is sufficient to explain the turning to irrationalist solutions without resort to the assumption that everyone before Popper has had a blinkered preoccupation with justificationist formulations.

It seems that Popper himself finds his theory so rationally compelling that he has difficulty in understanding how other rational persons could fail to be equally compelled if only they understood it properly by stepping outside the justificationist framework within which they are imprisoned. However, while the attempt to identify and clarify misunderstandings is an important component of rational discussion, the resort to misunderstanding as the explanation for the failure of a theory to command universal rational assent does nothing to advance the rationalist argument.

The only way for the rationalist to refute the irrationalist position decisively is to produce a rationalist solution - i.e. a solution

to the problem of the intersubjectivity of knowledge founded in a universal rationality - that will command the assent of all, or at least nearly all, rational subjects. Lacking this a rationalist approach to the theory of knowledge can only be founded in the rationalist belief that such a solution to the problem is yet possible and therefore may be found if only we persist in trying.

At the same time it is not surprising that some forsake that rationalist belief not because, as Popper argues, they have been side tracked by a pseudo-problem but because they are dissatisfied with the persistent failure of rationalist attempts to solve the common, convergent problem of intersubjective universality in scientific knowledge.

1.2.4 The Role of the Knowing Subject

Widely divergent theories of knowledge in the Western philosophical tradition thus converge in these two basic problems:

What are acceptable tests of a fit between knowledge claims and the experiential universe?

What is the basis for the intersubjective universality of knowledge?

Justificationist formulations set one of the possible agendas for a solution to the first question and objectivist formulations set one of the possible agendas for a solution to the second. In both cases other formulations are possible that set a different agenda for solving the same basic problems.

If an evaluation of divergent agendas is to avoid being nothing more than reinforcement of a belief in the correctness of one of these agendas and become a critical discussion of the comparative merits of the agendas we need to do more than compare the contrasting agendas; we need to evaluate them in terms of their success in solving the common basic problems in which they converge. Theories of knowledge that may appear to be incommensurable when considered in terms of

their divergent formulations of the problems prove commensurable in terms of underlying basic problems of which these divergent formulations are the first steps toward an attempted solution.

These two basic problems are inseparable from a third convergent problem, which is the central problem of this study:

What is the role of the knowing subject?

No one can deal with the first two basic problems without, implicitly at least, dealing with this third problem. Any answer to the first two will imply an answer to the third and conversely any solution to the third will affect the possibilities for solving the first two.

For example, any rationalist solution to the first two must presuppose a self-authenticating rationality of the subject that can override all non-rational factors. Conversely, if we conclude with Polanyi that all rationality of the subject has a fiduciary rootedness, a rationalist answer to the first two problems becomes impossible.

Popper, in spite of his "Epistemology without a Knowing Subject", is no exception. An argument for the exclusion of the knowing subject is itself, of course, addressed directly to the problem of the role of the knowing subject, to which it gives a negative answer. But, further than this, Popper does not, in fact, exclude the subject from a role in cognition. In arguing for "Epistemology without a Knowing Subject" he is simply arguing for the recognition of a realm of objective, autonomous knowledge the existence of which is independent of all knowing subjects. He does not deny that there is also a knowing of a knowing subject and indeed, asserts (Popper, 1979:158-161) that the world of autonomous, objective knowledge is itself the product of knowing subjects.

In relation to this question of the role of the subject Piaget (Piaget & Garcia, 1983:293-294) saw his position as contrasted not only

to that of Popper but to that of other major figures in recent English-speaking philosophy of science, Feyerabend, Hanson, Kuhn, Lakatos, Toulmin, though he also recognised parallels between his position and theirs. He regarded them all as defective because of their preoccupation with methodological questions to the neglect of a thorough consideration of the nature of the activity of the subject.

Undoubtedly there is a gulf in this respect between Piaget and his contemporaries in the mainstream of philosophical epistemology in the English-speaking world. It is a gulf that makes it difficult for philosophers to take Piaget's work seriously if they have become accustomed to regarding the way of formulating the problems within that mainstream as the universal norm for rational philosophical discourse about issues of epistemology.

Yet underlying this divergence Piaget and the group of English-speaking philosophers whom he names share significant common ground in relation to this very problem of the role of the knowing subject. Historically there have been, at least, four basic positions developed with regard to this problem with, of course, important variants within each position: the knowing subject has been regarded as (i) apprehending intelligible objects (ii) abstracting intelligible objects, (iii) registering and processing knowledge as sensory impressions, and (iv) forming knowledge in accordance with an intelligible structure. This will be discussed more fully in section 1.5.

The positivist tradition, that has had a strong influence in English-speaking epistemology, assumed that the subject's role in cognition is the registering and processing of sensory impressions. In its Logical Positivist development epistemological discussion centred on the identification of universal logical norms governing this processing, with the formulation of logical rules to ensure the correspondence of theoretic terms with sensory observations taken as unques-

tioned data.

The group of philosophers cited by Piaget in the above passage, in spite of the sharp divergences between them, is united in a shift toward the position that the subject is formative of knowledge. That shift is reflected in the shift of attention to the role of theories as human formations and not merely a logical arrangement of data. Popper (1972:117) is quite explicit about this: "Theories are our own inventions, our own ideas; they are not forced upon us, but are our self-made instruments of thought".

Though there remains a significant divergence, Piaget takes common ground with this group of philosophers in rejecting the view that the subject is a mere processor of data in favour of the view that assigns a key formative role to the knowing subject. In Piaget, indeed, this is combined with the view that the epistemic subject abstracts knowledge from objects resulting in a significant modification in the tradition that regards the knowing subject as formative of knowledge.

This is to be discussed in more detail later. For the moment it is sufficient to make the point that in the problem of the knowing subject Piagetian epistemology converges with epistemological developments in the mainstream of epistemological discussion in the English-speaking world.

The problem of the role of the knowing subject is the immediate concern of this study. However, the inseparability of this problem from the other two basic problems - the criteria of testing for a fit with the experiential universe and the basis of intersubjective universality - will demand that close attention be given also to these problems as they relate to the central problem under discussion.

1.3 THE METAPHYSICAL PROBLEM

Both Piaget (1970b:111-127; 1972:37-56) and Popper (1983:80-82) claim to have developed an epistemology without metaphysical presupposi-

tions. They both reject the positivist claim that metaphysical questions are meaningless (Piaget,1972:59-61,305-307; Popper,1983:179-181,194-214). Not only do they agree that metaphysical discussion has a meaningful place in the totality of human experience but they agree in asserting the value of metaphysical problems for scientific knowledge in the identification of basic problems, or research programs, for science (Piaget,1972:307; Popper,1983:189-193). Nevertheless they each claim to have developed an epistemology that is independent of all metaphysical presuppositions.

In the case of Piaget the claim rests on the scientific character of the epistemology. By reformulating problems of philosophical epistemology as scientific problems to be dealt with in a rigorously scientific way they are removed from the metaphysical context.

In the case of Popper the claim rests on the logical character of epistemology as methodology. Since the logical structure of the methodology does not require metaphysical propositions Popper's epistemology is wholly independent of metaphysics.

At this point a gulf appears between the two positions. As a purely logical discipline, a methodology, Popper's epistemology eschews all empirical claims. On the other hand, as a scientific discipline Piaget's epistemology has an indispensable empirical basis. It is one of his criticisms of Popper's epistemology that it disregards empirical data to restrict itself to the formulation of methodological norms (Popper,1983:xxv; Piaget & Garcia,1983:293,294).

Yet, in both cases, the claim to an epistemology wholly independent of metaphysics goes hand in hand with a recognition that the epistemology has been developed within a wider context where metaphysical questions have a meaningful place. Popper (1983:xxv,81) tells us that his methodology is "largely based on metaphysical realism" which serves as "a kind of background".

Piaget, for his part, in claiming that a world view ("une conception du monde [Weltanschauung]") (Piaget & Garcia, 1983:280) has a significant role in the development of scientific theories, acknowledges, implicitly at least, the influence of such a world view with its metaphysical components in the development of his own epistemology. Nevertheless, as a scientific epistemology he claims that it functions independently of metaphysical presuppositions.

What each appears to be claiming is that, while an epistemology can only be developed within a wider context that includes metaphysical elements that, one way or another, influence the shape of the epistemology, once developed it can function, and his does function, as a self-contained system without metaphysical reference. That is, no metaphysical concept or value is necessary to the internal logic of the theory.

It may be granted that a theory of knowledge may be developed without employing metaphysical concepts in its internal logic. However if, as Piaget and Popper both appear to acknowledge, the theory, in its overall formulation, is dependent on a wider network of theories and beliefs which includes metaphysical presuppositions as essential components, is not the validity of the theory, as a theory of knowledge - as distinct from a merely formal logical system - dependent on these metaphysical presuppositions?

If this is the case what, if anything, is to be gained by the exclusion of metaphysical propositions? Does not such an exclusion serve only to confuse the issue by making it appear that the epistemology stands or falls by its own internal consistency when all the time its validity is dependent on hidden metaphysical presuppositions?

1.4 THE COGNITIVE STATUS OF SCIENCE

In tracing the contours of the problem to be discussed science and

scientific knowledge have been given a prominent place. There is a good reason for this. For both Piaget and Popper scientific knowledge is the chief interest of epistemology because scientific knowledge is taken to be the highest level development of knowledge. All other forms of knowledge are more primitive forms of the same basic kind as scientific knowledge. While Polanyi (1962:374-379) takes a broader view of knowledge, for him also scientific knowledge has a prominent place in the cluster that constitutes the highest level of knowledge, ("superior knowledge").

This concentration of attention on scientific knowledge raises a further, and final, problem for the present study: What is the cognitive status of science?

Logically there are several possible answers to this question. We might say, with Piaget and Popper, that scientific knowledge is the most sophisticated, highly developed form of knowledge. Or, we might go a step further in that direction and say, with Monod (1970:213-217) that science alone yields true knowledge. Or, we might join Polanyi in saying that scientific knowledge is one component of knowledge in its highest level of development. Or, with Feyerabend (1965:217) we might say that scientific knowledge is merely an excellent example of actual knowledge without giving it special status or authority. Then again we might say that scientific knowledge is one kind of knowledge among others that are to be seen not as a hierarchy but as mutually complementary forms of knowledge.

Which, if any, of these logically possible solutions to this problem we should adopt and on what grounds will be an important part of the following discussion.

In addressing this question the problem of the demarcation of science inevitably arises. In considering the contribution of Piaget within the context of the French-speaking philosophical tradition a

dimension of this problem comes to view that has commonly been neglected in recent discussion in the English-speaking tradition.

Discussion in the English-speaking world generally assumes that science means the physical sciences together with such other disciplines as adopt successfully the model of the physical sciences. Piaget (1970) endorsed this view of science as a normative proposal but, operating within the French-speaking tradition he could not take it for granted. He had to argue the case for it - as he did at some length.

In the French-speaking tradition, as elsewhere in continental European thought, a broader conception of science has prevailed in which science embraces all academic disciplines. On this conception of science the physical sciences constitute a sub-group of the larger group of scientific disciplines.

More is involved here than a mere semantic difference. The conception of science as embracing all the academic disciplines is based on the assumption that underlying the differences between these disciplines there are common characteristics that unite them and mark them off from other areas of human life as a single enterprise with distinctive features. On this conception the problem of demarcation has two dimensions: there is the question of the demarcation of science as a whole and there is the question of the demarcation of sub-groups of disciplines - e.g. "natural" sciences, "human" sciences - within science.

On the other hand, the conception of science as restricted to disciplines conducted on the model of the physical sciences assumes a fundamental disparity between the academic disciplines such that it is inappropriate to designate them all with the common term "science". There is the further assumption that, since it is the physical sciences that meet the requirements of what has been intended historically

by "science", it is most appropriate that this term be restricted to the physical sciences and, with qualification, to other disciplines modelled on them. On this conception the problem of demarcation is a simple one. It is the question of the demarcation of the physical sciences as a single, self-contained epistemic enterprise.

A critical discussion of these two conceptions of science and the assumptions involved will be essential to an adequate treatment of the theme of the present study.

1.5 THE HISTORICAL BACKGROUND

In dealing with the historical background I make no attempt at a comprehensive historical survey of the treatment of epistemological problems. To do this in any satisfactory way would require a major study in itself. The purpose of the present survey has the strictly limited purpose of identifying certain typical answers to the basic problems being considered in this study that are significant for understanding and comparing Piagetian epistemology and contemporary developments in the English-speaking world.

Given this limited purpose I leap over centuries and pass by philosophers that could not responsibly be ignored in any comprehensive historical study. Similarly, while I do not believe that I attribute to any philosopher views that he has not espoused in his published works, I do not attempt to explore all that a particular philosopher or group of philosophers has said on the relevant epistemological questions. So, for example, when I associate certain typical answers with Plato and Aristotle I do not suggest that these constitute anything like exhaustive accounts of the treatment of epistemological themes in Plato and Aristotle respectively. What I do claim, and all I claim, is that the basic contours of these typical answers to epistemological problems are to be found in the writing of Plato and

Aristotle respectively.

1.5.1 Knowing as Rational Apprehension of Universal Truth

An important approach to epistemological problems within the Western philosophical tradition, which Plato may be credited with establishing firmly within that tradition, has regarded knowledge as the rational apprehension of truth.

Plato resolved the problem of intersubjective universality by postulating, as the object of knowledge, a realm of eternal Ideas. Since these are infallible and invariant, the apprehension of them gives knowledge that is universally true for all apprehending subjects.

The apprehension of these Ideas is by an intellectual activity that transcends sensory experience. Sensory experience is disqualified as a source of knowledge because it yields only opinion which may be either true or false, with the mixture of truth and falsehood varying from person to person (see, for example, Plato, 1953: *Theaetetus*, 191c-195b). As a practical guide to action, true opinion is as valuable as knowledge but it lacks the universal certainty and stability of knowledge. The stability and certainty of knowledge can result only from the reasoning processes of the intellect transcending sensory experience (Plato, 1953: *Meno*, 97-98c).

There is, in the Platonic scheme, a complete epistemic disjunction between sensory experience and the reasoning processes productive of knowledge. Knowledge does not begin with sensory experience in order to go beyond it; it sets aside all sensory experience. To attain knowledge of astronomy, for example, we must ignore observations of the heavens since these can never lead us to the exact truth that alone counts as knowledge (Plato, 1953: *Republic*, 430a-c).

Mathematics acquires a special place in this scheme as a kind of bridge from sensory experience to knowledge. Mathematical study is invaluable because it compels the mind to leave the world of sensory

experience in order to get at the truth by pure thought. In this way it trains the mind for apprehension of the universal truth of the Ideas (Plato, 1953:Republic, 521e-531e).

Yet, though there is this complete disjunction between sensory experience and the acquisition of knowledge, knowledge once acquired is not disconnected from the world of sensory experience. It is knowledge of the order of reality that gives form to the world of sensory experience. As the world of becoming, the world of sensory experience is a world of instability and change that can never engender the stability and certainty of knowledge (Plato, 1953:Republic, 534a,b). But the order of reality that the intellect apprehends in the Ideas is the order for this world of becoming so that knowledge of these Ideas is knowledge of the real nature of things in the sensory world (Plato, 1953:Republic, 534b, 596-597d). Only by ignoring sensory experience in order to apprehend intellectually the real world of Ideas can I truly know the world of sensory experience.

The Platonic solution to the problem of intersubjective universality in knowledge, then, has two essential elements. Knowledge is knowledge of an eternal and invariant intelligible reality that is the universal order for the whole world of human experience; what is known is the universal order of reality. The second element in the scheme is that as an intelligible reality this universal order can be apprehended only by the human intellect so that the human intellect replicates in human thought the universal order of reality. Genuine knowledge, then, so far as it is possessed at all will be identical in all subjects at all times and places since it is the replication of the invariant universal order of reality.

As regards the problem of acceptable tests of the fit between knowledge claims and the experiential universe the Platonic scheme excludes all empirical tests that require the use of sensory experience.

Sensory experience is intrinsically unreliable. It can give us no standard by which to measure truth and reality. This can be attained only on the level of pure thought isolated from all sensory experience. The only admissible tests of knowledge claims, therefore, are logical tests. Any knowledge claim must pass the logical tests of the Platonic dialectic (Plato, 1953: Republic, 531d-534e).

To the mind accustomed to an empiricist frame of reference this will seem to be a strange way of testing for a fit between knowledge claims and experience. How can we test for such a fit without any reference to the world of sensory experience which the knowledge is supposed to fit? It seems like the absurdity of a tailor testing the fit of a suit of clothes without any reference to the person whom the clothes are to fit. It seems clear, on this argument, that Plato's tests are only tests for the logical coherence of knowledge claims and cannot be tests for a fit between knowledge claims and the experiential universe.

But the argument depends on an empiricist ontology and collapses as soon as we shift the discussion into the framework of the Platonic ontology. An empiricist ontology assumes that the world of sensory experience is the real world giving us reliable primary cognitive data. On such a view it is absurd to test knowledge claims without testing them against our sensory experiences.

On the other hand, the Platonic ontology takes the reverse view that the intelligible world is the real world giving form to the uncertain world of sensory experience. On this view knowledge will fit this world not if it matches the sensory experiences but only if it matches the intelligible reality that gives form to this world. Any fit with sensory experience will be a deceptive and, at best, transient fit, since it is a fit only with the transient face of the sensory world and not with the enduring reality of its intelligible forms.

On the empiricist view knowledge may well be likened to a suit of clothes which needs to be tailored to fit the body of sensory experience. On the Platonic view knowledge is more like identifying the genetic code that enables us to make sense of the body of sensory experience.

With regard to the problem of the knowing subject, the Platonic subject is an intelligent subject who replicates the intelligible universal order of reality by a process of rational apprehension.

Knowledge, in this Platonic epistemology, is normative rather than informative; it is concerned with how we ought to act rather than with giving information about the experiential universe as it is. Associated with this is the view that right human action is not a matter of conforming to the existing order of things in the sensible world but is a matter of conforming the sensible world to the normative order of the intelligible reality. This feature is important in understanding the persistent vigour of this approach to epistemology in the subsequent history of philosophy.

It needs to be reiterated that this discussion of Platonic epistemology has not been an attempt to present a comprehensive view of the complexities of epistemological discussion in the writings of Plato. Nothing more has been attempted than to trace the basic features of a type of epistemology, of particular relevance to the present study, that is to be found in Plato. This same restriction will apply, to a greater or lesser extent, to each of the other philosophers or groups of philosophers yet to be discussed in this section.

1.5.2 Knowing as Rational Abstraction from Sensory Experience

This second basic approach to epistemological problems gained a firm place in the tradition through Aristotle. A thorough analysis of the Aristotelelian epistemology would involve a number of complex questions, including questions related to stages in the development of Aristo-

tle's thought, that go beyond the present purpose. As with Plato, for the present purpose it is sufficient to identify in Aristotle the basic contours of a distinctive approach to epistemological problems that is relevant to the present study.

In direct and conscious opposition to Plato Aristotle (1928:De Anima,432a) asserted the necessity of sensory experience for knowledge; "... no one can learn or understand anything in the absence of sense ..." (see also Aristotle,1928:Metaphysica,980a). All knowledge is founded in sensory experience.

What is registered in the mind by sensory perception, however, is not the material object but a sensory impression of the form of the object abstracted from the object which is a form-matter composite. In this connection Aristotle (1928:De Anima,424a) uses the metaphor of a signet ring in wax. The impression in the wax does not correspond to the ring as a material object. It corresponds to the form of the ring. Similarly the sensory impression in the subject does not correspond to the object of sensory perception as material object but to the form of the object.

So far it simply looks like a realist correspondence theory of truth. Since it would be an absurdity to propose that material objects as such or a material replica of these objects is present in the subject, Aristotle uses the form-matter distinction to establish a correspondence theory with regard to sensory perception. What is registered in the subject in sensory perception corresponds to the form of the object of perception; that is, it corresponds to the cluster of properties that are characteristic of the object of perception.

Yet, looking more closely we find that, while knowledge is impossible without them these sensible forms in the mind of the subject are not cognitive data; the possession of them does not, in itself, constitute knowledge nor are they any kind of elementary units of know-

ledge.

The reason Aristotle gives for this is that sensory perception is perception of individuals (particulars). The sensible form that is registered in the subject in sensory perception, as the form of an individual, is itself individual, a particular cluster of particular properties. Knowledge, on the other hand, is always of universals (Aristotle, 1928: *De Anima*, 417b; *Metaphysica*, 980b, 981a, 1003a, 1059b-1060b; *Ethica Nicomachea*, 1039b-1141a). Although knowledge depends on sensory perception the two are not to be confused; the one has to do with the knowable and the other with the sensible. The knowable is always distinct from the sensible (Aristotle, 1928: *De Anima*, 431b). Knowing is the result of thinking and not of sensory perception (Aristotle, 1928: *De Anima*, 429a).

Although the sensible form is not the knowable, outside thought the knowable is inseparable from the sensible. In cognition the knowable is abstracted from the sensible form by definition; this abstracted knowable is a universal which can be isolated from the sensible form only by the mental process of definition (Aristotle, 1928: *Metaphysica*, 103a, 1059b).

The use of the term "definition" in Aristotle needs careful consideration since it is a ready source of confusion. "Definition" in Aristotle's epistemology is not an exercise in propositional logic or the fixing of the meaning of words within a language system. Definition identifies in precise terms the universals that are the intelligible core of reality. It is the identification by the human intellect of an intelligible reality that exists independently of that intellect. The Aristotelian universal is not a mental construct, a notion in the mind; it is not a class of particulars, the product of inductive logic. Universals are the ultimate and innermost core of reality. A true definition, therefore, is a proposition that corres-

ponds to an element in this innermost core of reality.

On the lower cognitive level of technical knowledge (art), it is true, Aristotle (1928:Metaphysica,981a) appears to regard knowledge as gained by inductive generalisation but at the higher level of knowledge properly speaking (science) definition identifies the universal not by induction but by abstraction. In thought the mind dissociates the universal form from the sensible form given in sensory perception just as in sensory perception the senses dissociate the sensible form from the form-matter composite of the object of perception. "The mind is the form of the forms and sense the form of sensible things" (Aristotle,1928:De Anima,432a). It is this abstracted universal that is the object of knowledge properly speaking.

It is, therefore, misleading to speak of the Aristotelian universals as instantiated in the particulars. To do this is to project back onto Aristotle a modern, individualistic notion of universals that is alien to him. The particulars are the ever changing sensible face of reality; the universals are its invariant inner core. In reality they are inseparable but in definition they are separable, being quite distinct from each other (Aristotle:De Anima,413b,432a; Metaphysica,993a,1034, 1040b). In knowledge we do not begin with the particular, as in sensory perception, and proceed from these to the universal. By definition knowledge begins from the universal (Aristotle,1928:Metaphysica, 1018b).

The Aristotelian epistemology embodies a correspondence theory of truth but not the modern theory that holds a proposition to be true if, and only if, it corresponds to sensibly observable reality. In the Aristotelian scheme a proposition is true if, and only if, it corresponds to intelligible reality which is distinct, though inseparable, from observable reality.

D.M. Armstrong (1973:122), therefore, misses the whole point of

Aristotle's view of reality when he asserts that "Aristotelian Realism about properties is independent of Aristotelian Essentialism". Certainly, it is possible eclectically to reject Aristotle's essentialism while maintaining a realism of properties of particulars that parallels Aristotle's views in certain respects, but then we no longer have "Aristotelian Realism". For Aristotle, ultimate, unchanging reality is the reality of essences, the intelligible reality that is the inner core of all we experience.

Armstrong, it seems, misses the necessary connection between Aristotelian realism and Aristotelian essentialism because he reads Aristotle's essentialism in terms of his own non-Aristotelian ontology. In this ontology, characteristic of the modern philosophical mainstream, the basic categories are mental and physical. Given this ontology the intelligible is equated with the mental; there is no room for any non-physical non-mental intelligible reality.

When Aristotle, therefore, says that nothing is given in sensory perception but propertied particulars this can only be interpreted to mean that outside of thought nothing is known to exist except the propertied particulars. Hence the essences of mental reality must be nothing but those clusters of particular properties that are the essential sensory properties of the thing. The universals, as intelligibles, can only be interpreted as mental categories, the products of thought that are instantiated in the sensible particulars.

The interpretive logic is compelling given the modern ontological framework of mental and physical. However, it is entirely unsatisfactory to interpret Aristotle with such an ontological framework that was alien to him. In the Aristotelian ontology, as in the Platonic, the intelligible is an ontic category distinct from, though closely related to, the mental. Unlike the Platonic ontology, the intelligible reality that gives form to the material world does not consist of

intelligible entities separate from material reality but neither does it consist of mental categories that universalise the sensible particulars. It consists of the intelligible core of material reality distinct from its sensible appearance and identified by intellectual abstraction from the sensible givens.

For Aristotle, therefore, the essences are not particular properties or groups of properties that stand in a special relation to material objects. The essences are the intelligible reality that is abstracted by definition from the observable in which it is embedded. Certain clusters of particular properties are the essential properties of a particular, not because they constitute its essence, but because of their necessary relation to the essence. Indeed, the particular properties of sensory perception, so far from functioning as essences, themselves have corresponding essences (Aristotle, 1928: *Metaphysica*, 1029b-1032a).

Aristotle, as much as Plato, regarded the world of sensory experience as lacking the stability and certainty necessary for knowledge. Consequently, like Plato, he founded knowledge in the experience of an intelligible reality beyond sensory experience. Unlike Plato, he did not detach this intelligible reality from the sensible but embedded it within the sensible as the unchanging order of reality giving constant form to the sensible. As a result the knowing subject instead of transcending sensory experience abstracts the intelligible from the data of sensory experience.

Lezl (1975:361) suggests that it may be confusing to use the term "abstraction" univocally in this connection since there is a distinction in Aristotle between the cognitive dissociation of universals and of mathematical entities. There may well be merit in this but the distinction is not important for the present purpose. In both cases there is an intelligible reality embedded in the sensory data that is

identified by dissociating it from the particularity of the sensible; it is in both cases abstraction in the sense of distinguishing an intelligible reality by dissociating it in thought from its inseparable coherence with the material reality in which it is experienced.

The Aristotelian answer to the problem of intersubjective universality of knowledge, then, is to make knowledge consist in the replication in thought of an intelligible reality that is the universal and invariant order for the whole world of human experience; the universal order of reality is replicated in the thought of the human subject. In this respect there is a close parallel with the Platonic answer although the manner of the replication is quite different.

Also similar to Plato's scheme is the answer to the problem of the fit between knowledge and the experiential universe. Knowledge fits the experiential universe as it corresponds to the intelligible order of reality that is the constant and universal order for the experiential universe. Tests for this fitness, therefore, are primarily logical tests. Unlike Plato such tests must include an empirical reference but this empirical reference is limited to showing that a logically coherent account of the material world of our sensory experience can be given in terms of the cognitively defined intelligible order.

When we come to the role of the knowing subject the divergence of the Platonic and Aristotelian approaches to epistemological problems comes into sharp focus. Whereas Plato's knowing subject must ignore sensory experience in order to apprehend the transcendent Ideas, Aristotle's subject must penetrate the world of sensory experience in order to abstract from it intelligible, form-giving reality that is the inner core of that world; an inner core inaccessible to sensory perception and accessible only to abstractive thought.

For knowledge as rational apprehension of universal truth as transcendent reality Aristotle substitutes knowledge as rational abstrac-

tion of universal truth as immanent reality.

Aristotelian epistemology also differs from the Platonic in its emphasis on knowledge as knowing the necessary order of reality, the way things are rather than the way things ought to be. This is reflected in Aristotle's interest in the knowledge of ultimate causes as the highest level of knowledge.

1.5.3 Knowing as Rational Processing of Sensory Data

A third fundamental approach is that associated with Stoicism, in which knowledge is understood as a rational processing of sensory data.

As with Plato and Aristotle it is beyond the present purpose to attempt a detailed exposition of Stoic epistemology with an analysis of the variations between Stoic thinkers that this would require. No more is required and no more is attempted than an outline of the main contours of an epistemology that has had a significant influence in the subsequent development of epistemological thought.

Unlike both Plato and Aristotle, the Stoic epistemology took the data of sensory perception as primary cognitive data. Where Plato held that cognition must transcend sensory experience and Aristotle that it must abstract from it the primary objects of cognition, the Stoics held that cognition begins with the data of sensory perception. The impressions registered in the mind by sensory perception are the fundamental units of knowledge.

Whereas Aristotle maintained a disjunction between the senses and the thinking mind, the Stoics regarded the senses as the instruments of the mind providing the communications link between the mind and the external world. In much the same way as the television cameras in a closed-circuit security system feed information to the security monitor the senses feed inputs to the mind (Hicks, 1962:63-66).

However, while Stoic theory made the impressions of sensory experi-

ence the primary and direct source of knowledge it by no means reduced knowledge to a stream of sensory impressions. The impressions must be processed by Reason ordering the impressions in accordance with its own rational order.

Rist (1969:24) argues that it is confusing if we simply equate the Stoic Reason with the modern conception of rationality. That is no doubt true in so far as the Stoics did not distinguish sharply the rational function from other functions of the human mind. But, as Hicks (1962:64) suggests, this is due to the merging of all the functions of human consciousness in the rational function rather than a lessening of the rational. The Stoic Reason (*λογος*) which has the epistemic function of processing the stream of sensory impressions so that coherent and certain knowledge results is decidedly rational thought.

It is by this Reason that we both distinguish true from false impressions - that is, impressions that rightly represent reality from misrepresentations - and give to our impressions a systematic order that corresponds to the order of reality (Hicks, 1962:66f-73; Epictetus, 1940:224-225). While Reason needs to be trained if it is to function effectively, so that education is primarily the training of the Reason (Epictetus, 1940:226-227), it possesses an innate structure that is peculiarly fitted to systematise the sensory impressions.

Epictetus (1940:260) makes this point by describing Reason as a "system framed from impressions of a certain kind". Taken in isolation it may be tempting to take this to mean that Reason is amorphous until it is structured by the sensory impressions impressed in it, but that would miss the point Epictetus is making in this context. He is arguing for the unique nature of Reason as that alone of the human faculties that is able to take cognisance of itself. He argues that it can have this power of self-cognisance only if it is itself of like

kind with the objects of which it takes cognisance. Since a faculty of the mind can take cognisance only of those matters for which it is fitted, Reason, which is fitted to take cognisance of impressions can take cognisance of itself only because it is itself of a like kind with impressions; "it is a system formed from impressions of a certain kind". In Epictetus' system, then, it necessarily has this character before it receives any sensory impressions, otherwise it could not take cognisance of any impressions.

Since Reason is an innate faculty that enables us to deal rightly with the impressions we receive through the senses there can be no question of its being produced in us by sensory impressions though it can be developed by interaction with those impressions. Rather, Reason, as an innate human faculty, is homogeneous with the impressions it receives through the senses. All this comes together when we take note that this reasoning, as an innate human faculty, is part of the divine Reason that is the immanent ordering principle of reality. Consequently, human Reason is uniquely suited to process the sensory impressions that, so far as they are true impressions, are impressions of a reality ordered by the divine Reason.

Basic to the Stoic epistemology was the notion that nature and human thought share in a common rationality as the common ordering principle. It was this notion that gave the Stoics their confidence in sensory perception as the prime source of knowledge. In the Platonic scheme thought must transcend nature to apprehend the Ideas that are the ultimate order of reality. In the Aristotelian scheme thought must penetrate nature to uncover the intelligible Forms that are the ultimate order of reality. In the Stoic theory rational thought participates innately in the rationality that is the ultimate order of reality.

According to Hicks (1962:22), already in the school of Zeno of

Certainly the Platonic Ideas came to be seen as notions in the mind. Epictetus (1940:261), much later, more clearly appears to maintain the existence of innate rational principles in the form of primary conceptions common to all men. Zeller (1962:80,81) argues that, despite the admitted appearance of innateness in these primary conceptions, such a view cannot be correct since it would be contrary to the whole character of the Stoic system. However, it seems altogether consistent with the notion that human rationality is part of the universal ordering principle of reality to add the notion of innate rational conceptions as ordering principles of knowledge corresponding to the ordering principle of reality.

The Stoic approach to the intersubjective universality of knowledge, then, found the answer in the universal participation of rational human thought in the universal rational order of reality. And the fit between knowledge and the experiential universe is assured by the rationality common to nature and thought provided the sensory data is correctly processed. The test of this correct processing is the achievement of intersubjective universality in the analysis of sensory experience.

As to the role of the knowing subject Stoic epistemology regards the subject as the rational processor of the data of sensory experience. The subject neither transcends this data nor abstracts from it since the data as given in sensory perception is the primary data. What is required of the subject is the rational processing of the sensory data.

1.5.4 Rationalism and Irrationalism, Intellectualism and Empiricism

Before attempting a systematic review of these three epistemological types emerging from Greek/Hellenistic thought it is important to clarify some key terms that I will be using in that review and, from time to time, throughout the rest of this study. Although these terms

are common enough in philosophical discourse their exact meaning often remains ambiguous, not always helping us to make clear distinctions. For this reason I regard it as important to make as clear as possible the sense in which I will be using them in this study in order to give some precision to the categorisation of epistemological types.

I use the term "rationalism" for the view that the rationality of the subject functions as the universal, self-authenticating subjective authority in cognition.

By "subjective" authority I mean that it functions as cognitive authority in and for the subject.

By "universal" authority I mean that the nature and operation of this rationality is taken to be identical, in principle, in all subjects in which it operates. Its operation may be suppressed or retarded in one subject and more developed and advanced in another so that we may speak of the one as more or less rational than the other, but so far as the specified rational faculty is operative its characteristics will be identical in each subject leading to identical results in its functioning.

By "self-authenticating" authority I mean that the rationality in question is regarded as carrying with it the credentials of its own authority, not being dependent on any extrinsic accreditation to establish its subjective authority.

In this connection it is important to distinguish this quality of self-authentication from autonomy. An autonomous rationality is one that contains within itself the principles or law of its own functioning, not being subject in that functioning to any authority outside itself. Thus an epistemological rationalism built on the notion of an autonomous rationality will regard the principles of cognition as intrinsic to that rationality independently of any authority external to such rationality.

A rationality of limited authority that is dependent on an authority external to itself, though lacking autonomy, may still be self-authenticating. Plato offers an excellent example of such dependent but self-authenticating rationality as universal subjective authority. In his discussion of dialectic (1953:Republic,531d-534) he makes it clear that dialectic is the means by which we grasp in pure thought the very first principle as a reality external to thought. In such a scheme it is clear that we cannot speak of an autonomous rationality of the subject; the ultimate principle or law by which the subject's thought is deemed to be governed is external to that thought and not given in thought. What "gives the objects of knowledge their truth and the knower's mind the power of knowing" is not some quality of the knowing subject but "the Idea of the good" that, though it can be known, is beyond knowledge, beyond the knower and all other objects of knowledge (Plato,1953:Republic,508e).

Yet, though clearly not autonomous, the rational functioning of the subject's mind that Plato here identifies under the term "dialectic" is self-authenticating in its unique ability to give the subject a grasp of the very first principle in pure thought. This rational functioning authenticates itself by its unique ability to give the required clear and distinct definition of the Idea (Plato,1953:Republic,534b). It cannot be the Idea that authenticates the rational functioning that leads to it since apart from this rational functioning we have no knowledge at all of anything but only uncertain opinion. And Plato offers us no other authority that can establish the credentials of this rational functioning as the one authentic guide to true knowledge. Indeed the whole procedure of his dialogues is founded on the assumption, taken as self-evident, that if truth and true knowledge as universal values are to be found they will be found by the human subject through rational argument.

I shall discuss in the next sub-section the emergence of the notion of an autonomous rationality leading to what I prefer to distinguish as a distinct sub-type of rationalism. I use the term "rationalism", however, to embrace all those views that hold the rationality of the subject to be the universal, self-authenticating subjective authority in cognition, with or without autonomy.

I use the term "irrationalism" for any view that identifies the subjective self-authenticating authority in cognition in an aspect of the subject's functioning other than rationality. I do not, of course, imply by it a rejection of the rational function in cognition but only that the rational function is subordinated to some other aspect of the subject's functioning as the final subjective authority. Polanyi's epistemology is thus irrationalist because he subordinates the subject's rationality to the subject's believing as the ultimate subjective authority.

The other pair of terms the use of which it is important to clarify at this stage is the pair "intellectualism/empiricism".

I use the terms "intellectualism" for those views that take the primary cognitive objects to be intelligible objects, objects directly accessible to, and only to, the intellect. The term "empiricism" I use for those views that take the primary cognitive objects to be empirical, or sensible, data given through, and only through, sensory experience. This primary data may, of course, as in Hume (1978) generate secondary data that function also as objects of knowledge.

The intellectualism/empiricism distinction does not correspond to the rationalism/irrationalism distinction. The practice that has become common in modern philosophical discourse of contrasting empiricism with rationalism is, I suggest, confusing. We may take empirical data to be the primary cognitive objects while also assigning subjective authority to a universal rationality of the subject as the arbi-

ter and processor of this data. Indeed, the predominant forms of empiricism till the 20th century have been rationalist in character. Similarly, intellectualism is not tied to rationalism but may be either irrationalist or rationalist in character.

It is important to note, further, that while intellectualism implies the cognitive primacy of the intellect and empiricism the cognitive primacy of sensory experience intellectualism does not exclude the cognitive use of the senses just as empiricism does not exclude the cognitive use of the intellect. Kant (1933:41), for example, insisted that "all our knowledge begins with experience" since it is only by sensory experience that our faculty of knowledge is awakened. Yet his epistemology is decidedly intellectualist and not empiricist since while sensory experience plays a role in cognition it does not furnish the primary cognitive data.

Neither is an epistemology to be classified as "empiricist" merely because sensory experience is taken in some sense as a source of knowledge. An epistemology is "empiricist" only when the primary cognitive objects are given in sensory experience as empirical data; cognitive objects may be derived from sensory experience in some way without being given in that experience as empirical data. The distinction, I suggest, is important for reasons that will be discussed further in the following sub-section.

1.5.5 The Greek Heritage

Any complete discussion of the epistemologies of the Greek/Hellenistic periods, of course, would need to take account of a host of subtleties and variations that have been passed by in the foregoing survey. However, this would take us beyond the purpose of the present discussion which is to identify three basic views of the role of the knowing subject that emerged from Greek/Hellenistic thought and played a decisive formative role in the subsequent development of Western