undoubtedly an element of convention in the way in which the distinctions are drawn in academic practice which should be always open to challenge on the ground of the arbitrariness or inadequacy of its distinctions, but there is a basis for the distinctions in the structure of reality. And it is on the basis of an analysis of this structure than any challenge to existing or proposed academic practice should be based.

4.3.4 The Multiple Foci of Knowing

This leads to a consideration of the question of variety within both modes of knowing. Doug Blomberg, a close and respected colleague, has proposed a theory of multiple ways of knowing to deal with this problem (Blomberg,1978:146-234). Because, on the one hand, the work he has done in this area has had a significant influence in the development of my own thinking and because, on the other hand, I find his theory unsatisfactory at certain points it is appropriate to discuss this theory before presenting my own alternative.

Taking the basic structure of Herman Dooyeweerd's epistemology as his starting point Blomberg aims to make good what he regards as deficiencies in Dooyeweerd's theory. These he sees in the restriction of knowing, other than religious knowing, to theoretical knowing and undifferentiated naive experience. Blomberg argues that there is a need to make room for differentiated non-theoretical knowing. His proposal for making good this deficiency is to add eight further ways of knowing that, together with theoretical knowing, make up nine ways of "distantial knowing" distinct from the knowing of naive experience and religious experience.

Dooyeweerd's modal theory has such a fundamental role in Blomberg's theory of ways of knowing that it is important, at this point, to give at least a summary description of the basics of this theory. Dooyeweerd maintained that an analysis of empirical reality reveals

irreducible modal aspects that refer not "to a concrete what, i.e., to concrete things or events, but only to the how, i.e., the particular mode, or manner, in which we experience them" (Dooyeweerd, 1960:6). He speaks of these modal aspects as "law-spheres" with a functional structure; they are, in other words, functional modalities - ways of functioning - of empirical reality that are subject to specific laws of functioning (Dooyeweerd,1948:41-48; 1953-8:Vol.2,1-54).

Doyeweerd identified 15 of these irreducible modalities: numerical, spatial, kinematic, physical, biotic, psychical, logical, historical, lingual, social, economic, aesthetic, juridical, moral and faith (pistic). The terminology for describing these modalities varies both in Dooyeweerd's own writing and in those who have followed him in the further development of the theory. I have used those employed by Dooyeweerd (1953-8).

It should be observed that Dooyeweerd's modal theory is an ontological theory and not an epistemological one though, like all ontology, with epistemological significance.

This brief summary is wholly inadequate to do justice to the complexity of Dooyeweerd's modal theory; a theory that is, in my view, a valuable philosophical tool. However it should be sufficient as background to the following discussion.

Approaching the problem as an educational theorist with a special interest in curriculum development, Blomberg adopts Dooyeweerd's basic epistemological framework but finds his distinctions of "naive experience" (roughly equivalent to everyday or common sense knowledge) and "theoretical thought" inadequate to do full justice to the diversity of empirical knowledge. There are significant ways of knowing, he argues, that cannot be accounted for by either of these categories.

Taking a cue from Seerveld (1968) he proposes eight "distantial" ways of knowing as an extension of Dooyweerd's epistemological catego-

ries parallelling Dooyeweerd's theoretical thought. Dooyeweerd characterises theoretical thought as an attitude in which the logical modal function and non-logical modal aspects of experience, that are given together in "our real act of thought in its temporal concreteness", are distanced from each other as opposites; the object of theoretical thought is a non-logical modal aspect "within the temporal totalstructure of the act of thinking" abstracted as "Gegenstand", objectified by the intention of the subject as the antithetical opposite of the logical function (Dooyeweerd,1953-8:Vol.I,36-44).

Blomberg extends this notion, in a modified form, by proposing that we recognise eight further distantial ways of knowing in which each of the eight post-logical modal functions (the eight that come after "logical" in the above list) of Dooyeweerd's modal theory in turn "takes the lead". In Blomberg's terminology this gives us the following eight ways of distantial knowing: techno-cultural, lingual, social, economic, aesthetic, jural, ethical, confessional. The "distancing", in these cases however, is quite different from Dooyeweerd's "distancing" of theoretical thought; it is not an antithetical relation of modal functions within the act of thinking but "a standing apart from "what-is, in order to know what-ought-to-be" (Blomberg, 1978:191,201-302). He distinguishes these eight further ways of knowing as "practical" in that the subject knows the world "in order to act into it that he may transform it" whereas in the theoretical mode he simply sets out to know the world as it is (Blomberg,1978:206).

What Blomberg proposes, then, is the addition to the basic Dooyeweerdian epistemology of eight further modally qualified ways of knowing which, as "distantial knowing", are of the same kind as theoretical knowing and, as "practical knowing" are distinguished from theoretical knowing. In my view he is undoubtedly correct in recognising the need to acknowledge a greater variety and more profound

penetration of non-theoretical knowing than is allowed in Dooyeweerd's theory of naive experience. However there are serious difficulties in his attempt to give a theoretical account of this rich variety of knowing.

Firstly, there is the separation of knowledge into theoretical and practical, factual ("what-is") and normative ("what-ought-to-be") categories (Blomberg,1978:190-192,206). Blomberg himself (1978:206) likens his theoretical and practical categories to the Kantian distinction of pure and practical reason. The Kantian overtones, indeed, are apparent at this point but it would be quite misleading to regard Blomberg's theory as Kantian in any but the most superficial sense. Unlike Kant he gives the normative/practical realm a cognitive status parallel to the factual/theoretical, grounds normativity not in human freedom but in the structure of creation and rejects the Kantian separation of the "technically-practical" from the "morally-practical" (Kant,1928:Part I,8-11).

Nevertheless he does distinguish scientific disciplines - in which, following the older tradition, he includes all the academic disciplines - as theoretical and factual in character from his eight distantial ways of knowing which he characterises as practical and normative.

In a recent defence of his theory (1986:1,2) he denies any intention to restrict theoretical knowing to the factual, pointing out that in his view the "what-is" includes "normative dimensions of experience, as these have been positivised." Theoretical knowing on his account therefore, he argues, has a normative dimension in that it deals with these positivised norms. But positivised norms are clearly factual, as Blomberg acknowledges (1986:2) when he says that the normative concern of theoretical knowledge is confined to "the factuality of norms". To allow for a consideration of norms in theoretical knowing

but to restrict this consideration to positive norms in no way modifies the restriction of theoretical knowledge to the factual.

The difficulty I see with this is that it does not match the actuality of the enterprise of scientific, or theoretical, knowledge. The common practice of science is by no means restricted to attempting to understand "what-is" without concern for transformational actions. On the contrary much scientific research is "for practical purposes" in order to "act into the world" so as to transform it. And in doing so it does not restrict itself to the analysis of positive norms but devises normative theories to assist in the changing of human practice.

If theoretical knowing were restricted to the factuality of "what-is", economic theory, for example, would be restricted to an analysis of economic relationships in their presently existing factuality, forbidden to construct theoretical models as preferred alternatives to the "what is" of actual economic practice; any judgment that economic structures ought to be other than they are would be ruled out as beyond the boundaries of theoretical knowledge as knowing "what is".

Similarly the ethical theorist would be forbidden to explore any basis for ethical norms beyond the actual norms by which people act; to specify that ethical norms ought to be anything other than those actually specified or practised would be going beyond the factual boundaries of ethics as a theoretical discipline. So we might continue. In short, academic disciplines would be subject to a restriction that is not commonly observed and never has been observed except under the inhibiting influence of a now largely discredited positivism. (This is not to suggest that Blomberg's theory attempts to resurrect positivism.)

Much better grounds would be needed than are given by Blomberg before attempting to impose such a restriction with the massive recon-

struction of the theoretical enterprise that would result. Indeed it is doubtful that Blomberg would want to impose it in practice but it is nevertheless the inevitable consequence of a consistent application of his theoretical/practical, what-is/what-ought-to-be distinction.

Secondly, there are serious ambiguities in his notion of "distance" in relation to the practical ways of knowing. In Doyeweerd's theory the "distance" of the Gegenstand relation of theoretical thought is a setting apart within the structure of the subject's thought of the logical and non-logical modal functions that, in the concrete actuality of that thought can only exist in indissoluble coherence; this makes of the non-logical function a mental entity as the immediate object of theoretical thought. The distancing of Blomberg's non-theoretical ways of knowing is a distancing of the knowing subject from the concrete objects; it is not a relationship of modal abstraction but of the concrete subject-object relation (Blomberg,1978:191).

In the first place, it is not at all clear that the subject and object are distanced or set apart from each other in the situations described by Blomberg. Blomberg speaks of it as objectification (Blomberg,1978:203,204,237) but as we follow his exposition it seems more appropriate to regard this objectification as an act of focussing on objects within concrete experience, rather than an objectifying distancing or setting apart of subject and object.

In clarification of this point, Blomberg (1986:3) argues that the distancing consists in "things that were earlier unproblematic, defining the space in which we move and to this extent an extension of ourselves" becoming "recognisably Other". This makes the "distancing" rest on the doubtful proposition that the normal, adult subject in everyday concrete experience - Dooyeweerd's naive experience - experiences the object world as, in some sense or to some extent, an extension of the subject. Piaget claims that something of the sort

characterises the experience of the young infant but there appears to be no reason to suppose it to be a feature of normal adult experience. Blomberg goes on (1986:4) to describe what is involved as a constituting of the object "as a particular focus of attention". It seems to me that the notion of "focussing" is adequate to describe what occurs in the kind of situation to which Blomberg refers without introducing the doubtful notion of "distancing"; it is not the object that is constituted (objectified) by this act but the "focus of attention".

In his clarification of this notion of "distancing" Blomberg (1986: 3-5) points out that it includes the notion of "focussing" such as I employ but insists that "distancing" is "a necessary condition for this focussing to occur". Distancing, he explains, results from a "dissonance" in our experience that poses a problem as "a necessary prelude to assuming a particular modal stance towards reality".

I have no difficulty with the view that such problem-posing dissonances occur in our experience and that they are a significant motivation to cognitive activity. I do not think, however, that the proposition can be sustained that they are a necessary prelude to the kind of focussed knowing that Blomberg describes. It is probably true that a problem of some kind - taking problem in the broadest sense - is a necessary prelude but it need not be a problem arising from experiential dissonance; it may equally well arise, for example, from the subject's curiosity about the world that motivates him to explore it more closely.

And, in any case, "distancing" seems to me an unsatisfactory metaphor for describing what happens in such problem situations. Rather than distancing it seems that what happens is that the subject pays closer and more concentrated attention to the experiential field to identify and focus on the source of the dissonance in order to remove it.

Thirdly, no adequate bond is established between Blomberg's eight practical ways of knowing and Dooyeweerd's theoretical knowing such as to warrant classifying them all in the one category as "distantial knowing" unless it were on the basis of an extreme nominalism, which Blomberg certainly rejects. The common language of "distance" is used for two disparate relationships. In the case of theoretical knowing it is a conceptual relationship internal to human thought that sets apart in an antithetical relationship of thought what can only exist in concrete actuality in indissoluble coherence. In the case of Blomberg's practical knowing it is a concrete subject-object relationship that puts a distance between concrete subject and concrete object that are already distinguishable in the actuality of their concrete existence. There is nothing to unite these two conceptions other than a common use of the language of "distance".

Blomberg appears to recognise this problem by proposing a double-distancing in the case of theoretical knowing: "distanced on the subjective side from the multi-aspectual attitude of naive experience, and distanced on the objective side from concrete things, in the abstraction of an aspect" (Blomberg,1978:213). But this only blurs Dooyeweerd's distinction between "naive experience" and "theoretical thought" leaving us in confusion as to the object of theoretical thought. In Dooyeweerd's Gegenstand theory the object of theoretical thought is an <u>intentional</u> object that exists only in the subject's act of thought though undoubtedly <u>intended</u> to relate to modalities of empirical reality. It is "an <u>intended abstraction</u> out of the total, actual knowing-act" of the subject, not an abstraction from concrete objects (Dooyeweerd,s.a.:5)

It seems to me that Blomberg has correctly identified an empirical richness of cognitive diversity of which an adequate theory of knowledge needs to take account and which is not accounted for by Dooye-

weerd's theory of knowledge. I am personally deeply indebted to him for drawing this empirical reality to my attention. That he does not give a satisfactory theoretical account of this empirical state of affairs appears to be due, in part at least, to his uncritical adoption of Dooyeweerd's epistemological framework.

As in other areas of philosophy Dooyeweerd's epistemological contribution is an important one from which I have personally benefitted greatly. The recognition of the cognitive role of "naive experience", the abstractive character and modal orientation - in the sense of Dooyeweerd's modal theory - of theoretical thought and the religious roots of all knowledge represent epistemological contributions of great importance.

On the other hand, his incorporation within his epistemology of a theory of intentionality, akin to if not borrowed from the phenomenology of Husserl - who was in turn indebted to Brentano - interposes a cognitive barrier between the knowing subject and empirical reality such as to frustrate an adequate theoretical recognition of the sort of state of affairs to which Blomberg draws attention. Dooyeweerd modified the concept in significant ways in comparison to its use in Husserlian phenomenology, in particular by restricting the Gegenstand relation to theoretical thought and then modifying it in terms of his own modal theory but the basic concept remains crucial both to his anthropology and even more so to his epistemology .*

The basic concept of the theory of intentionality is the postulate, common to Dooyeweerd and Husserl, of intentional objects as mental entities that constitute the immediate objects of subjective consciousness. Cognitive objects are always intentional objects that are the products of the subject's intention in the act of consciousness and

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* In this connection I am indebted to Taljaard (1976) for stimulating me to engage in a closer analysis.

not the objects of material reality as such (Dooyeweerd,1953-8:Vol.I,38-44; s.a.:4,5; Husserl:1977:23-30).

This does not rule out all correlation between the intentional objects of cognition and empirical reality. Indeed, Dooyeweerd insists on such a correlation. Nevertheless, cognitive objects are always intentional objects generated by the intentional direction of the subject's thought.

According to Dooyeweerd these intentional objects in the naive or pre-theoretical attitude are intentional states of affairs; they are the product of the subject's intentional direction to states of affairs in the world of empirical reality, this intentionality producing intentional states of affairs in the mind (Dooyeweerd,s.a.:4). In this respect there is a certain similarity to the sense data of empiricism except that whereas the sense data are impressions registered in a passive mind intentional states of affairs are the products of the active intention of the subject directed toward empirical states of affairs.

As already discussed, the object of theoretical knowing, according to Dooyeweerd, is not an intentional state of affairs but an intentional modal abstraction objectified from within the structure of the subject's thought-act in an antithetical relation to the logical function of that thought. At this point Dooyeweerd's theory imposes a significant restriction on all non-theoretical knowing. It is impossible to have any direct empirical or non-theoretical knowledge of the modal differentiation of reality since the intentional objects of such knowledge can be produced only within the antithetical intentional relation of theoretical thought; we cannot objectify the modal differentiation as intentional objects from our immediate experience of reality but only from the structure of the thought-act.

The reasons for rejecting any theory, such as Dooyeweerd's inten-

tionality theory, that postulates a world of mental entities as the immediate cognitive objects have been given, in substance, in the discussion on the notion of abstract concepts as mental entities in the previous subsection and need not be repeated here. It is sufficient to say that it is neither necessary nor desirable to interpose an intermediate realm of mental objects between the knowing subject and the reality to be known, which, other than in the case of self-knowledge, is always a reality distinct from the subject and the subject's knowing. There is no good reason to suppose that the knowing subject does not enter into a direct, interactive engagement with this reality, using, to be sure, conceptual instruments to facilitate this engagement.

Pure mathematics and formal logic are no exceptions. In this case the object of the knowing activity is a formal, symbolic system that is certainly the creation of human subjects but as a symbolic system constitutes a reality distinct from the subject that sets out to know it and/or reconstruct it.

It should be noted carefully that the objection to Dooyeweerd's, and Husserl's, use of intentionality is not an objection to the argument that the subject in knowing intends an object; the objection is to the notion that the intended object is a mental entity that is the product of the subject's intentionality. Discarding these intended objects does not, of course, involve a denial of the active role of the subject in cognition. On the contrary, I wish to argue that knowledge demands not only an active but a constructive knowing subject.

Given his renunciation of rationalism the correlation between the intentional objects of theoretical thought and the subject-independent structure of reality on which Dooyeweerd insists does not improve matters. It simply means that his theory of the theoretical attitude of thought leaves him entangled inextricably in the typical ration-

alist internalisation of the structure of reality within the subject; ontologically the structure of reality is subject-independent but epistemologically we know it by knowing the internal structure of our own thought-act.

In accepting Dooyeweerd's intentionality based theory as his own base Blomberg left himself with limited scope for developing a theory of differentiated, non-theoretical knowing. The direction he took is possibly one of the few he could have taken in these circumstances. When we remove the intentionality theory from Dooyeweerd's theory of knowledge, however, the way is open to recognise the empirical state of affairs to which Blomberg draws attention as a closer concentration of attention on, a focussed engagement with, certain features of the experiential field characterised by differentiation, but not distancing, in our knowing. It is a situation of which Polanyi has at least a glimpse in his notion of focal and subsidiary awareness. We have the capacity to focus on a selected feature of the total experiential field, isolating this feature from the rest of the field as the focus of our attention without losing the rest of the field but shifting it to the edges of awareness.

We all know about or can readily experience this focussing in the visual field. There is a central focussed field of vision at any given time with a peripheral field that we see "out of the corner of our eyes". Ordinarily there are a number of correlated objects within this central focussed field but, if we wish to obtain more detailed knowledge of one object within that field, or even of a particular feature of an object such as its colour, we further concentrate our vision so that it focusses on this one object or this one feature of an object, with all else shifting into peripheral vision, or subsidiary awareness. Both the focussing and the continued subsidiary awareness of the rest of the visual field are important.

It is to be noted that this conscious focussing in the visual field is for the purpose of knowing; it is a cognitive act. We focus on an object or a feature of an object for the sake of a more careful and detailed discrimination of that object or feature. To be effective, of course, this must be correlated with other occasions of a similar focussing on other objects and/or features of objects.

This cognitive focussing, illustrated from the visual field, is not limited to the visual field but is a characteristic of our knowing activity in all its dimensions and relationships. It is characteristic of our knowing activity that in our cognitive engagement with the experiential field we selectively focus on objects, groups and classes of objects, properties, relationships and functional aspects within this experiential field in order to achieve a more detailed and effective discriminating correlation without losing the rest of the field but shifting it to a subsidiary awareness. By a closer focussing we are able to make distinctions that we would miss without this focussing.

This focussing leads to a differentiation in our knowledge in response to differentiation in the structure of reality. In the theoretical mode it leads to the differentiation of academic disciplines. But focussing and the consequent differentiation is not peculiar to the theoretical mode; it occurs also in the concrete mode.

In this cognitive mode we can, and do, focus on the modal functions (such as are identified in Dooyeweerd's modal theory discussed earlier) not as theoretical abstractions but as functional modes of the concrete relational field. The illegitimate restrictions on concrete knowing imposed by Dooyeweerd's intentionality theory prevents this from being recognised; remove that restriction and it becomes obvious. The functional modes of Dooyeweerd's theory are modes of functioning of the concrete experiential field that we can and do distinguish in

direct engagement with that field.

It requires no theoretical abstraction in a Gegenstand relation, to focus on the numerical aspect of the experiential field as a function of concrete objects in a non-theoretical concrete engagement with that field as occurs, for example, in a simple counting of objects. Or the gardener with no knowledge of biology will focus on the biotic aspect of a plant as a concrete function of the concrete object that he wishes to "keep alive", implying such a biotic focus in the very language "keep alive". Or the artist for whom aesthetic theory is so much useless gobbledegook will achieve nothing without focussing on the aesthetic aspect of the concrete relational field which he focusses on not as a theoretical abstraction but as a concrete function of concrete objects.

In all these, and other cases like them, a focussing on a functional aspect as an aspect of concrete reality in a concrete engagement of the subject with that reality yields differentiated knowledge of that aspect. This, it seems, is precisely the kind of differentiation of non-theoretical knowing that Blomberg so rightly finds missing in Dooyeweerd's theory. However, the deficiency is not, I suggest, to be made good in the way Blomberg proposes by an extension of Dooyeweerd's notion of "distancing" - a weak point in Dooyeweerd's theory of knowledge - but by a recognition of the multiple foci of knowing in concrete as well as theoretical modes.

It should be noted that this allows us to recognise the differentiation in non-theoretical knowing as going further than Blomberg's theory will allow. The concrete focussing of which we now speak can focus on any one of the modal aspects and is not restricted to the eight allowed by Blomberg's theory.

Any account that the subject gives of the knowledge gained by focussing on a modal aspect in the concrete cognitive mode will be un-

likely, of course, to conform to the terminology of Dooyeweerd's modal theory, unless the subject is articulate in this modal theory. The subject is unlikely even to identify the object on which the attention is focussed as being a modal aspect. But, the same is true for differentiated theoretical knowing. A philosophical analysis suggests that scientific activity is characterised, among other things, by a focussing on modal aspects, yet few scientists could articulate what they they are doing in modal theoretic terms. This in itself, of course, is not to say that the philosophical analysis, using its own methods and specialised language with which the scientist is unfamiliar, has not correctly identified the nature of the focus of the scientist's attention. Of course, it would be another matter if, having understood the nature of the philosophical analysis, the scientist was able to show that the philosophical analysis does not match the actuality of his practice as scientist. Then there would be a need to re-check the philosophical analysis. Similarly with respect to the differentiation of the concrete mode of knowing, we are not warranted in concluding from the subject's inability to use the language of modal theory that the subject does not focus on the modal aspects of reality that are articulated in this theory. Indeed, as already observed, knowing may occur in the concrete mode without the subject being able to articulate the knowledge at all, much less be able to give it a theoretical articulation.

And, unless we rule out the possibility a priori by a theoretical embargo such as Dooyeweerd's intentionality theory imposes, it is apparent that in the examples given above, as well as in many others that might be given, subjects do focus cognitively on aspects of the concrete experiential field that, when examined in Dooyeweerd's modal theoretic terms, are modal aspects of reality - numerical, biotic, aesthetic, etc.

While the multiple foci of knowing in the concrete mode certainly include focussing on functional modes the possibilities do not appear to be restricted to this kind of focussing. We may focus, for example, on a property such as colour or on a class of objects such as dogs. A thorough analysis of the possible foci of knowing in both concrete and theoretical modes, however, is beyond the scope of the present study. It is sufficient for the present purpose to have identified the existence of a differentiated focussing of knowing in the concrete, non-theoretical mode.

It is important to recognise that while the differential focussing of our knowing may often be motivated by the desire to act on reality in some way, as in the case of the artist focussing on the aesthetic or the gardener focussing on the biotic, such a motivation is in no sense intrinsic to the focussed act of knowing. A person who has no intention of producing a work of art, for example, and who lacks the skill needed to do so may cognitively focus on the aesthetic aspect of concrete reality with as sharp a discrimination as the artist. Indeed such a person may have the advantage of an openness to reality that facilitates a sharper and more penetrating discrimination than an artist who interprets reality within the limiting framework of a particular artistic style or fashion.

The richness and discriminating power of the differential focussing of knowing in the concrete mode has long been obscured by the dominance of the mistaken notion that scientific knowing is the most highly elaborated and sharply discriminating form of knowledge which in its advance eclipses all lesser forms of knowledge. The adherence to this notion as a basic epistemological presupposition is a major defect in the work of both Piaget and Popper.

While Polanyi seems to open the way for a break with this notion in the *end he* accredits science as "superior knowledge". It is only in

Feyerabend and Deutscher that we find a decisive break with the notion of science as an overriding cognitive authority, a way to guaranteed superior knowledge. So far as this represents a general trend it opens the way for the recognition of the rich possibilities and discriminatory power of knowing in the concrete mode, not as a rival but as a complement to and primary base for theoretical knowing. Simultaneously it opens the way for an end to the distorting dominion of the scientific, in the modern sense of "scientific", within the theoretical mode of knowing.

Yet, in this new development a new danger lurks. The theory of knowledge is becoming so diffuse that important distinctions are in danger of being lost to sight. Knowledge is coming to be regarded as an undifferentiated field in which any differentiation is purely conventional and in which the concrete/theoretical distinction counts for nothing. The theory of knowledge is then in danger of being reduced to discussions about the attitude or style of the knowing subject.

Feyerabend's major contribution is the negative contribution of the iconoclast who may be expected, in his iconoclastic zeal, to demolish things of genuine value along with the false idols, leaving it to others to reconstruct something worthwhile from the wreckage.

Deutscher's contribution, in contrast, has the constructive purpose of recovering things of value that have been cast aside as philosophically worthless by the analytical tradition that has so long dominated Anglo-Saxon philosophy. The tradition against which he reacts inhibited philosophical discourse by arbitrary distinctions that isolated it within an artificial world of formal logical discourse. Having escaped the inhibitions of this artificially restricted world of philosophical discourse, however, we will not find a fruitful way forward by allowing philosophical thought to meander through a world of ideas in which there are no clear boundaries and no coherence other

than an ad hoc stringing together of ideas. While Deutscher shows an awareness of this danger it is a tendency that he has not been able to avoid in his own work.

What is needed is a careful redrawing of epistemological boundaries within an ontological coherence that acknowledges the rich variety of cognitive possibilities in both concrete and theoretical modes in a cognitive unity that is responsive to the richly diverse and open, yet coherent, structure of reality which is the context of philosophical thought, as of all human existence. In view of the key role of the knowing subject any such redrawing of boundaries will need to go hand in hand with a careful anthropological analysis.

4.3.5 The Constructivity of the Subject

For many centuries the theory of knowledge, and popular conceptions, were dominated by the view that knowledge replicates or corresponds to the states of affairs in a subject-independent reality. On this view knowing has to be based on the acquisition in some way of subject-independent data with the role of the subject limited either to the recognition of authentic data and rejection of the illusory and/or the arranging of data in appropriate ways, with "appropriate" defined by subject-independent rules.

Perhaps the changing conceptions of the world that accompanied the scientific revolution of the 16th and 17th centuries paved the way for the waning of this view but the decisive turning point came with the Kantian revolution at the end of the 18th century. When we come to 20th century Piagetian epistemology we find this once dominant view completely overturned. Knowledge is wholly a construction of the subject, in interaction with the objects of reality but guided by a logic internal to the subject. It follows from this that knowledge is no longer an acquisition of a body of knowledge of any kind but is a dynamic process of constructive interaction.

While Piaget has perhaps made this switch to the constructive subject most decisively and elaborated his constructivism in most coherent detail, the same trend appears in each of the others surveyed in this study - Popper and Polanyi as well as Feyerabend and Deutscher. Popper, for example, stays closest to the old view in that he maintains that truth is correspondence with the facts but retains this concept of truth only as a regulative idea since all our knowledge in the end is the product of the subject's constructive guesses that can never be anything other than more or less close approximations to the truth with the degree of closeness always unknowable - though we can assess the relative closeness of two guesses.

This shift to the recognition that knowing is a constructive activity of the subject is to be welcomed though with considerable caution. Caution is called for on two counts. There is a need both of careful distinguishing with regard to the constructivity of the subject and of a careful identification of the nature of the controls to which the subject is subject in this activity.

While knowing takes place in a direct relation of the subject with empirical reality without intermediate mental objects it is not a relationship of an empiricist type in which empirical reality is impressed on the subject. It is a responsive relationship in which the subject knows by constructing a coherent network of correlated distinctions in response to empirical reality within the limits of the subject's experience. In the absence of language this must be a severely limited, finite construction but with the aid of language it expands into a complex conceptual network that is not restricted to the limits of the immediate sensory experience and the memory of past experience. With the development of technology for permanent recording and storing of linguistic and other symbolic formulations the conceptual network, no longer dependent on the limits of collective human

memory, becomes infinitely expandable.

At no point, however, can this network of correlated distinctions replicate the cognitive objects since those objects are always more than the images, concepts and symbols of which our cognitive network is constructed. Conceptualisation and formalisation bring us no nearer to a copy of empirical reality since that reality is not reducible to concepts and symbols and their relations; once constructed these take their place within empirical reality but that reality is always more than these. The structure of knowledge is a construction of the subject to be distinguished from the structure of empirical reality to which it responds.

This distinction is as important for knowledge as a product as it is for the act of knowing. The subject aims, of course, to construct a knowledge (as product) that will be structured in such a way as to represent as faithfully as possible - or re-present - in some sense the structure of the relevant empirical reality. But the structure of this representation is always distinct from the structure of the reality represented.

For example, a chemist represents the chemical structure of a material object by a system of chemical symbols. This in itself represents only one aspect of the structure of the material object. Further, in relation to that one aspect the structure of the chemical symbols - that constitute the chemical knowledge of the object - is a <u>symbolic</u> structure that differs from the <u>chemical</u> structure that it represents.

But what of that inarticulate, intuitive kind of knowing that can be found in the experienced craftsman who, without apparent reflection and certainly without being able to give systematic reasons, knows that this material, not that, is suitable or that this procedure, not that, will solve the problem; or the self-trained motor mechanic who knows with seldom-erring accuracy just what is wrong with the engine

without being able to give a satisfactory systematic account of this knowledge? Does not the subject in such cases know by a simple intuition in the absence of all subjective constructions?

These are certainly to be acknowledged as genuine instances of knowing involving intuition - as no doubt does all knowledge in some sense - but they are certainly not instances of an intuition in the absence of a subjectively constructed cognitive network. The intuitive act of knowing does not occur in a vacuum but can only occur within the context of the subject's existent network of discriminating correlations in which specific materials and tools, machines and their components, procedures, relationships and classes of sensations are distinguished and correlated. Let any significant feature of this existent cognitive network prove inadequate to the situation - as when the craftsman encounters materials of a wholly unknown kind or the mechanic faces an engine of a distinctive but unknown design - and the intuitive knowledge will fail unless and until the subject is able to extend and modify the cognitive network in response to these new features of the experiential field.

The illusion of a purely intuitive knowledge in such cases can be sustained because, except when we are actively extending our conceptual structure, the cognitive network functions in an implicit and instinctual way so that we lose sight of its constructive origins. Hence, for example, the statement, "I know that a child is building a sand castle on the beach" appears in everyday discourse to be a simple statement of self-evident fact; a simple descriptive account of an uncomplicated observation. On closer examination, however, it is clear that it depends on an already existent conceptual network which gives factual meaning to the components of the sentence - "child", "build", "sand castle", "beach", as well as the linguistic rules by which these are related in the statement.

I do not suggest that we should cease, in everyday discourse, or even in many cases of theoretical discourse, to speak of such observational statements as simple statements of fact. However, it would be dangerous if, in epistemological analysis, we were to miss the point that such a statement of fact is only a statement of fact because the person making it and the person hearing it possess compatible networks of correlated distinctions that are not given in the observed state of affairs but are ultimately a construction of the human subject's response to such states of affairs. Neither the statement nor its constituent terms have any factual value outside the context of an existent cognitive network.

The case of knowing another person's linguistically formulated ideas may seem, at first glance, to be an exception to the rule that the object of knowing cannot be replicated in the knowing subject. Surely what is to be known in this case is itself a conceptual structure that can simply be copied within the subject's conceptual structure. It takes only a little closer examination to recognise that any such conclusion is deceptive.

The object of our knowing in such a case is not the linguistic formulations, per se, but the ideas of a subject that are articulated in these formulations. These ideas are always more than the linguistic formulations in which they are articulated, not because they are independent mental entities, but because they are the ideas <u>of a subject</u> the full meaning of which is given only in the full subjectivity of that subject that can never be embodied in, but only signified by, linguistic formulations. And, in knowing the linguistic formulations I can know them in no other way than in my own subjectivity.

The character of knowing as a constructive response to the objects to be known, therefore, applies fully in this case also. My knowledge

of another author's work is never other than my construction of that author's ideas. It may be a construction that is faithful to those ideas, and, if I wish to treat the other person with respect, I will make every possible effort to ensure that my construction is faithful to his ideas. Yet it is still my construction and not the replication of his ideas.

This touches on yet another important issue that merits more extensive treatment than it can receive here - the hermeneutical question. Some significant aspects of this problem are usefully discussed by Palmer (1969).

It is this constructivity of the subject and not the autonomous power of ideas as postulated by Popper's World 3 theory that accounts for the generation of new ideas and problems from existent theories and problem formulations. There is no difficulty in agreeing with Popper that the linguistic formulations of theories, problems and the like have an existence that is independent of the subject who produced them or of any other subject. Neither is there any problem in agreeing that there is a distinction to be drawn between thought-processes and linguistic formulations as products of thought-processes (Popper,1979: 298,299). Indeed, it is a distinction that is insisted on in the above analysis.

However, Popper draws the wrong conclusion from this distinction when he argues from it that, since theories as products are distinct from the thought-processes that produced them, theories are autonomous entities that generate ideas and problems independently of all subjects. This requires the theories to be more than the thought-processes that produced them and the whole point of the distinction is that linguistic formulations are always <u>less than</u>, not more than, thought-processes, since the latter are the processes of a subject who is never reducible to any set of linguistic formulations.

Popper's World 3 theory could be sustained only if we accept a thoroughgoing Platonism in which linguistic formulations of theories, problems and the like are not products of thought-processes but formulations of ideas as subject-independent entities existing independently of all thought-processes and linguistic formulations; if theories are products of thought processes only in the limited sense that the ideas, existing independently of all thought, are given linguistic form by thought-processes. At times Popper appears to be espousing such a Platonism with, of course, appropriate modifications, when he asserts the existence of an infinite ideal world containing "virtual" thought-objects prior to all thought and actualised in actual thought-objects (Popper,1979:116,159).

While Popper is, of course, free to postulate such a world it is a metaphysical speculation that sits oddly with the rest of his epistemology. Not only is there the unresolved problem, that has plagued all forms of Platonism, of the ontic status of such a world of ideas and the manner of our access to it, but the empirical evidence he advances in support is tenuous, to say the least, and is certainly better explained without the aid of the World 3 hypothesis.

It is granted freely that new problems, theories and understandings are generated from existent linguistic formulations that go beyond the understanding of the subject responsible for the existent formulation but it is a knowing subject that generates these and not the existent formulations. Every example that Popper gives requires the activity of a subject to generate the new material; in no case is there the slightest evidence that the material has been generated spontaneously by the existent theory.

For example, he cites the failure of Edwin Schrödinger to understand fully the Schrödinger equation, "at any rate not until Max Born gave his statistical interpretation of it" (Popper,1979:299). All we have

evidence of here is that one subject, Born, is able to give a construction to a formula that is richer than that of the subject, Schrödinger, who originated the formula. The straightforward interpretation of this situation is that it is the constructive activity of Born that advances the understanding of the Schrödinger equation beyond Schrödinger's original construction. To mystify the process by postulating a hidden content in the equation that was discovered by Born merely complicates unnecessarily an otherwise straightforward situation.

Up to this point, then, I concur with Piaget's constructivism. Knowing is a constructive activity of the subject in response to - or in interaction with - empirical reality. It is a view that is given substantial corroboration by the extensive and careful Piagetian research. Beyond this recognition of a basic constructivity of the subject, however, I part company with Piaget at important points in the further elaboration of his constructivism.

It is important to distinguish between the construction of the network of correlated distinctions that is constitutive of knowledge and the construction of conceptual and symbolic instruments that are instrumental in the development of this network. An example of instrumental construction is the construction of a mathematical system. A mathematical system is founded in the cognitive network and is, in various ways, incorporated in our knowledge. However, as a system it functions as a cognitive instrument not a constituent of knowledge. The founding of such a system in the cognitive network and its subsequent incorporation in that network, aided by the a priori assumption that knowledge replicates reality, readily obscures the status of the system as an instrumental construction.

To obtain a clear view of this situation, consider a simple arithmetical system. It is founded in, as a minimum, the discrimination of

discrete unity within empirical reality. This discrimination, that constitutes a feature of our knowledge, or cognitive network of correlated distinctions, is prior to the construction of an arithmetical system as witness its existence among people that lack an arithmetical system. Further, once the arithmetical system is constructed it is incorporated in our knowledge in multitudinous ways; "the average life span of the Australian male is 68 years", "the population of Australia is approximately 14 million" or "the chemical composition of water is two thirds hydrogen and one third oxygen" are knowledge-type statements incorporating terms taken from an arithmetical system.

However, the arithmetical system, as such, does not constitute knowledge of anything; it is purely a cognitive instrument. In saying that the arithmatical system as such does not constitute knowledge of anything I am not saying that it is not based on, and even perhaps incorporates, knowledge of the structure of empirical reality. It seems to me clear that it does have such a basis and that it is on account of this basis that it is useful as a cognitive instrument.

We may, of course, make the system a cognitive object and so have knowledge of the system just as we may know any other instrument but the system itself is not knowledge of something. To know an arithmetical multiplication system, for example, is to possess a valuable instrument that enhances my ability to know empirical reality but in knowing the multiplication system as such I gain no more than knowledge of a cognitive instrument; it is only in employing this instrument that I extend my knowledge of empirical reality beyond the instrument.

I am aware, of course, that this will be disputed by those who claim that a mathematical system reproduces the underlying structure of reality. I can only say that, so far as I can see, such a view involves a metaphysical speculation that does not match what actually

happens in cognition.

While, on the one hand, Piaget recognises the instrumental character of mathematical systems, on the other hand, he asserts a domain of logico-mathematical knowledge, distinct from empirical knowledge, that is far more than the knowledge of cognitive instruments. It is a construction of logico-mathematical forms that alone give intelligible shape to an otherwise indeterminate empirical content. The fundamental and necessary structure of all knowledge is a logico-mathematical structure constructed by the subject and formalised in formal systems. Hence the construction of logico-mathematical structures in the subject is more than the construction of cognitive instruments; it is the construction of knowledge itself.

It is at this point that I differ sharply and decisively with Piaget in a difference that is, at its roots, ontological rather than epistemological though with sweeping epistemological implications. To focus attention on this fundamental difference we need to leave, for the moment, the question of the status of logico-mathematical systems to consider the question of the nature of the controls in the constructive activity of the subject.

Piaget locates controls internal to the subject in the biological structure of the organism, a structure to which he assigns an emergent logico-mathematical character. Since this emergent logico-mathematical structure is not the structure of organic individuality but the universal structure common to all organisms it functions as a universal rational control ensuring the intersubjective universality of knowledge.

Yet this logico-mathematical structure is more than the structure of knowledge; it is the structure of reality which is a dynamic, transformational reality. Though Piaget does not directly assert, so far as I am aware, that the logico-mathematical structure of knowledge is the

structure of reality it is clearly implicit in his assertion that as knowledge in structured by more highly developed logico-mathematical structures it becomes more objective in the sense that it gives us better knowledge of reality.

The further implication, of course, is that the rich diversity of the multiple foci of knowing are reduced to a single, restrictive logico-mathematical focus. And while the concrete mode of knowing is retained it is wholly subordinated to the theoretical taken to be knowing in its most developed form. In place of a structure of sparkling diversity we are confronted with an austere monolith. If life itself escapes the austerity of an intellectual asceticism it is only by making room for a diversity outside the cognitive domain. In spite of his steady resistance of reductionism Piaget himself has fallen into a most radical reductionism that subordinates all experience to logico-mathematical categories. It is a reductionism that, I suggest, is inescapable when an aspect of the diversity of our experience is made into the epistemic governing principle.

It is my contention that Piaget has made two fundamental and closely related mistakes: he has reduced the structure of reality, or at the very least the structure of knowledge, to one facet of a richly complex reality and he has internalised this reduced structure within the subject. As an alternative I suggest that we recognise that the structure of reality is a richly diverse lawful structure that is not and cannot be internalised within the subject but is experienced by the subject in all the rich diversity of human experience and responded to rationally in the knowing activity.

The structure of reality is not the physical structure of material objects though in our experience of that physical structure we encounter the structure of reality in one of its many facets. Neither is the structure of reality the logical or mathematical structures that are

formalised in logical and mathematical systems, though these formalise our experience of facets of that structure of reality; nor is it a structure of ideas that can be replicated conceptually in the subject though our conceptualisation moves within the boundaries of its lawfulness.

It is a complex structure in which the manner, boundaries and limits of the multiple relations of the reality to which we belong and within which as subjects we interact with objects are lawfully governed. It is neither a structure in us nor in objects external to us but is the lawful context within which we and they exist in our multiple relations.

I speak deliberately of a structure of lawfulness and not of laws since the latter would too readily imply either a new kind of Platonic realm in which Laws replace Plato's Ideas or a reshaping of the Aristotelian Forms as immanent Laws, both of which I reject. I shall discuss this issue further in the appendix.

What we encounter in all the diversity of our experience is not law but a lawfully structured reality in which we ourselves function as one of the constituents; what we know is not law but the contours of the lawful structure. In knowing the contours of the lawful structure we do gain <u>insight</u> into the laws but only as they are revealed in the lawful structure.

Let me illustrate what I mean by this with an analogy. Some time ago I was walking past the customs check-point at Schipol airport, Amsterdam, when I was stopped by a customs officer who asked what I had in two metal cases I had with me. I replied that they contained a personal computer that I had used in my research at Geneva. He then informed me that as "tools of trade" I should have declared them. My defence was that I was unaware of this and had assumed *that, as* a very much used personal possession, it did not need to be declared.

Through this incident I gained insight into Dutch customs law though I did not then, and have not since, seen the relevant law. I gained insight into the law by the experience of its effect.

We have no inbuilt or a priori map of this structure of reality nor do we apprehend such a map by some kind of Platonic transcendence of our sensory experience. We come to know the contours of the structure of reality only as we plot it carefully, step by step, in our multi-faceted experience of reality.

"Experience" and "empirical" are to be understood not in the restricted sense imposed by empiricism but as encompassing the full range of human experience. To restrict our plotting of the structure of reality to one kind of experience - e.g. the scientific - is to restrict and distort our knowledge of that structure.

In order to know reality as it is we plot the lawful structure of interactions between the entities within the relational field of our experience. The more completely we can plot these relational interactions the better we will know reality as it is. Reality is not a reality of static entities in unchanging relations. It is a dynamic, constantly changing field in which there are no things existing by themselves but only things in interaction with other things.

We know well that even the object that appears to be most durable and unchanging, such as a massive granite monolith, is interacting constantly with its environment in the process of change that we call "ageing". Ageing should not be confused with decay. Decay is often associated with ageing but ageing in itself is an enriching, not a degenerative, process, as we observe, for example in the ageing of wine.

We know also that certain kinds of variations in the interactions of the relational field will bring more swift and dramatic change to the monolith than this slow ageing process, as occurs when an explosive

charge of sufficient power is brought into a certain relationship with the monolith.

We are able to have stable knowledge of this constantly changing reality because the change is not random - though an element of randomness is incorporated within its lawfulness - but is lawfully structured; the interactions that are involved occur in a lawful manner which we are able to plot in persistent patterns of interaction. The stability of reality is not secured by the immutability of its elements or of the relations between these elements but by the consistent lawfulness of the variable manner of their interacting.

It is in plotting the lawful manner of interactions that we come to know reality as it is, even though we may not be conscious that this is what we are doing. The knowledge of the permanency of objects, for example, comes from the recognition of a persistency in our sensory interactions with a given relational field. By a further plotting of interactions we know that this permanence is a conditional permanence; that specified changes in the manner of the interactions will destroy one or more of the objects in this relational field. The further we extend this plotting of this lawful structure of interactions the better we know reality.

The identification of "natural laws" in science is a more conscious plotting of this lawful structure of interactions. In this case we set out with deliberate and systematic purpose to plot persistent patterns of interaction which we can formulate as a "law". But "law of nature" is a misleading term implying as it does either a law in nature or a law by which nature is governed. In our formulations of "laws of nature" we do no more than formalise our plotting of a lawful structure of interaction within finite limits.

Any adequate plotting of the lawful structure of reality, however, cannot be confined to interactions of a persistent regularity such as

are plotted by science. It will need to make room for the unique, the individual, the occasional not as breaks or flaws in the lawful structure of reality but as intrinsic features of that structure.

The notion that the fundamental structure of reality is known exclusively or pre-eminently in those persistent regularities that science formulates as universal laws produces serious distortion not only in cognition but in the ordering of human life as these universal laws are taken as giving us, at least provisionally and within the present limits of our knowledge, the fundamental structure of reality. These laws, and the results of research based on them then become normative for the ordering of human life. The fruits of that distortion appear in the contemporary world, on the one hand, in a devaluing of the unique and individual in favour of the uniform and universal. This is reflected in a way of life in which, on the one hand, variety is achieved in the world of man-made objects not by fulfilling the potentials of unique individuality in the lawful structure of reality, but by various combinations of the uniform and universal; and, on the other hand, in reaction against the depersonalising effects of this scientifically governed uniformity, the value of the unique and individual is re-asserted in values detached from the lawful structure of reality floating in an indeterminate realm of personal freedom where anything goes.

The result is that we lose touch with the rich fulness of reality. Reality is neither a collection of individuals which we organise in universal categories nor an ordered world of particulars instantiating a universal reality. It is a lawfully structured complex in which the uniquely individual maintains its individuality only in lawful relations that can be articulated in universal laws and concepts.

While the structure of reality is not a structure of determining lawfulness that determines our existence within a static reality of

determined relationships, yet it has determinative aspects that set the boundaries of possibility in our acting on reality. Piaget thinks we know these boundaries by an internal deductive logic. I suggest that we do not but that we know them only as we experience their constraints in our ongoing interaction with empirical reality.

When men tried to fly by constructing wings strapped to their backs they encountered some of these boundaries between possibility and impossibility. Some then concluded, by a mistaken universalisation from limited experience of the lawful structure, that human flight is impossible. Later, by further exploration of reality, a way was found of flying that has steadily opened up more and more possibilities in this direction. Moving in one direction men encountered a boundary of impossibility but moving in a different direction multiple possibilities opened for achieving the same end.

It would be very unwise to conclude, from the failure of those past attempts, that it is impossible ever to devise wings that could enable a man to fly solo by direct attachment to his body but it is safe to say that it will only happen by new designs that are within the lawful boundaries of possibility and that avoid any attempt to cross the boundaries of impossibility encountered in the earlier attempts.

In short, reality is a reality of infinite, but lawfully circumscribed, possibility. Its possibilities are endless provided only we stay within the lawful boundaries beyond which is the impossible. We have no inbuilt or a priori map of these lawful boundaries but can plot them only by experience.

The human race has shown a remarkable facility for shutting itself up within narrow limits that artificially and arbitrarily restrict the range of possibility. At times it has been achieved by the authority of religious dogmas. Today it is more likely to occur by the authority of scientific dogmas.

No set of dogmas or a priori principles and no restricted domain of experience can lawfully set for us the boundaries of possibility since the lawfulness that sets those boundaries transcends all the limits of our experience. The infinitely rich possibilities of reality open up to us only as we dare to venture, in multiple directions and multiple ways, beyond the limits of actuality, yet always venturing with that careful sensitivity that is ready to withdraw and try another route when we touch a boundary of impossibility. Such withdrawal may not mean abandoning our aim but only looking for another way to reach it. The failure to attain our goal in one way does not say that the goal as such is unattainable but we will not achieve it, or any other goal, by defying the lawful boundaries of possibility within which we are enclosed.

Beside these determinative boundaries of the possible the lawful structure of reality also fixes normative boundaries, boundaries not between the possible and the impossible but between the meliorative and the degenerative, between possibilities that enrich and possibilities that impoverish reality. These boundaries are no more given in a priori principles than are the boundaries of the possible and the impossible but also require careful plotting within a broad experiential field.

In this case, however, the plotting of the boundaries is more complex than in the case of the boundaries of possibility. Since it is, in the nature of the case, impossible to cross a boundary of possiblility it is a relatively simple matter to identify it when we encounter it. Only a stubborn refusal to acknowledge that such boundaries exist can cause us to fail to recognise one when it is encountered in our experience. On the other hand, since normative boundaries, in the nature of the case, can be crossed so that human life does in fact function on both sides of these boundaries, they are not

so readily or simply recognised. Our plotting of them has the character of a positivising of norms in an interaction between our experiences of the consequences of our actions in specific contexts within the lawful structure of reality and our beliefs about the desirable goals for human life.

Within this context I note what Popper might regard as an as yet unanswered argument for his autonomous World 3. This is his argument that the logic of theories is such that no one, whether the originator of the theory or anyone else, can know the full logical possibilities of a theory (Popper,1979:299). This may well be the case but it establishes the autonomy of the theory only if we assume that the logical possibilities that may be developed from the theory are fixed autonomously by the theory. The argument for the autonomy of the theory depends on assuming that autonomy, rejecting all other possible explanations of the situation, which is an obvious vicious circle.

And there are other possible explanations that are as logically satisfactory as Popper's. Piaget , for example, would argue that the possibilities develop from the logical structure of the autonomous subject acting on the theory. Logically this fits the case as well as Popper's autonomy of theories.

Within the context of the ontology I am proposing the possibilities are fixed neither by the theory nor by the subject but by the lawful structure within which subject and theory interact. The theory is rich with logical possibilities neither because of a richness inherent in the linguistic formulation nor because of a logic inherent in the subject but because of the rich logical possibilities of the structure of reality that emerge as fulfilled possibilities only in the interaction of a knowing subject with the theory.

It is this lawful structure of reality, enclosing subject and object alike within its lawful boundaries that, I contend, is the control on

the constructive activity of the knowing subject, keeping that activity within the boundaries of rationality. This is the source of my difference with Piaget on the status of logico-mathematical structures. For him they constitute the fundamental structure of knowledge, answerable to the structure of reality and exercising universal rational control over the cognitive activity of the individual subject. As such they are fundamental constituents of knowledge.

For me the rational control over the subject's cognitive activity is exercised by the lawful structure of reality, that is independent of both subject and object, known by the subject but never known completely, in all the subject's varied experience. Logico-mathematical systems, therefore, do not formalise the basic structure of our knowledge much less of our being but are constructions responsive to our limited experience of one facet of the lawful structure of reality. Their function as systems, therefore, is a limited instrumental role, though components drawn from them are incorporated within our knowledge.

The attempt to press all knowledge into a logico-mathematical structure is seriously deformative of our knowledge. It is not merely an absolutisation of one facet of the structure of reality; it is an absolutisation of a severely limited experience of that one facet. It deprives us of the many rich dimensions of knowledge that cannot be contained within a logico-mathematical framework.

At this point a brief note on the truth value of knowledge is in order. Within the ontology of a lawfully structured reality such as I have sketched knowledge can never have absolute truth value. Such an absolute truth value would require a perfect and exhaustive correspondence of our knowledge with the lawful structure of reality. Such correspondence is ruled out both because our experience of the structure of reality is limited and because the relationship between our

knowledge and the structure of reality is one of response to and not correspondence with.

Nevertheless we can and should evaluate the truthfulness of knowledge claims in terms of the reliability of the response to a given relational field. In certain cases this will depend entirely on an evaluation of the reliability of the subject making the claim as, for example, in the case of an assertion of knowledge of a unique event - "there was a prowler in the garden last night" - to which no other subject was witness. In the case of the subject making the claim the evaluation of truth will depend on a self-evaluation of the reliability of the observation.

In other cases we will be able to test the reliability of the claim by the testimony of other subjects in which case the evaluation of truth will depend on an evaluation of the collective, or in the case of conflict the comparative, reliability of the subjects. In still other cases the evaluation will depend on an evaluation of the reliability of a community of subjects as is the case when, as constantly happens, a scientist accepts the truthfulness of an assertion accredited by the scientific community without personally testing the assertion in any other way. In only relatively few cases will the evaluation of truthfulness depend on a testing for reliability by the subjects's own experience of the same or a similar relational field.

In any case it is appropriate to evaluate the truthfulness of the assertion only in relation to the given relational field. So for example, the assertion "the earth is flat" may be judged truthful as an assertion related to the visual field of a person standing in the middle of Australia's Nullabor Plain but must be judged false as an assertion related to the field of astronomical science.

Similarly the truthfulness of the statement "the sun rises in the east" is no less true as an assertion of a state of affairs within our

everyday visual field because we now know that, within the field of astronomical science, the earth revolves around the sun. To say "the sun rises" is not an imprecise way of speaking that lingers in our language as a vestigial remnant of a primitive world view but is a precise and truthful assertion provided we recognise it as relative to a specific relational field and do not try to elevate it to an absolute truth. But then neither are the assertions of astronomical science to be taken as statements of absolute truth but only as truthful in relation to their own relational field. To assert that the sun does not rise would be a false assertion if made in relation to the visual field of everyday experience.

Evaluations of truthfulness also occur within the context of a belief network that, in certain cases, results in conflicting evaluations of truth. Further discussion of this situation must be held over to the next sub-section.

While I dissent from Piaget with regard to the rational control of knowledge for the above reasons, my dissent from the others is,if anything, even more marked. With Piaget there is agreement that there is a rational control operative in the construction of knowledge; the difference is over the nature of that control. The others, possibly excepting Deutscher, deny any rational control in the construction of knowledge, either confining it to a negatively critical role or denying it altogether. While I differ with Piaget as to the nature of the rational control, I agree that there is a rational control operative in the construction of our knowledge.

Finally, a careful distinction should be made between cognitive construction and transformational construction of reality. Contrary to Piaget, there is, I maintain, no sense in which cognitive interaction transforms reality. Our knowledge is transformed in multiple ways but reality is unaltered by our cognitive interactions with it. The tree

that I know first in a superficial visual perception remains unchanged by my further cognitive interactions that enlarge and deepen my knowledge of it. If my interactions with the tree are confined to cognitive interactions my deepened knowledge of the tree will not be as a transformed reality but as a better known reality.

The difference with Piaget in this respect appears to be due directly to the differing views of the structure of reality. For Piaget, to whom the structure of reality is internalised in the subject, an otherwise largely formless reality is transformed cognitively into a structured reality by its incorporation in the structure given in the subject's activity. For me, to whom the structure of reality is neither in the subject nor in the object but is a lawful structure encompassing subject and object in a lawful coherence, the object is fully structured independently of the subject's cognitive activity.

The subject does act in ways that transform reality, creating within it new forms, but this transformational activity is distinct from cognitive activity, even though the two are closely associated. The human subject especially is a powerful transformer of reality. The most obvious example of this is the technical activity that transforms material reality into new forms of material objects, forms that do not copy existing forms but create new forms.

This transformational activity is not limited, however, to the field of technological transformations. It is a serious misreading of the situation to suppose that the artist, for example, simply reproduces or brings out what is already present in existent reality; that the artist simply brings to light what is already there. The artist, like the craftsman, must begin with existent reality but, like the craftsman, though in a different way, the artist transforms that reality into a new form in his work of art.

We might go on to discuss other ways in which human activity trans-

forms reality such as the creating of new forms of social relations, new political structures, new varieties of plants and animals. In all its variations this transformational activity occurs, and can only occur, within the lawful structure of reality with its boundaries of possible and impossible, meliorative and degenerative interactions. For this reason transformational activity, if it is to be successful and enriching, must be closely correlated with cognitive activity. Indeed, since the cognitive and the transformational do not qualify concrete subjective acts but distinctive ways in which the subject relates to reality, they may well be present simultaneously in the one concrete act.

Before beginning the transformational activity the artisan or artist will need to know well the existing reality within the transformational field - the reality to be transformed, the subject's skills, the tools to be used - not only as an existent reality but in its possibilities within a normative framework. When the work is completed a new object of reality will have been created that constitutes a new object to be known. In these respects cognitive activity directly related to the transformational both precedes it and follows, potentially at least, from it.

In the act of creating the new object, however, there is likely to be cognitive as well as transformational interactions occurring simultaneously in the same concrete act. In shaping a piece of wood or producing a work of art the subject gains an in depth, differentiated knowledge of reality by the intensively focussed intimacy of the subject's engagement with the object required by the transformational activity.

The close interlocking of cognitive interaction and transformational interaction makes it easy to make the mistake of concluding that reality is transformed by the cognitive interaction. It is undoubtedly

the case, for example, that the scientific technology of the present era has transformed reality in dramatic ways. By comparison with the reality that was known even a hundred years ago the reality to be known today is a reality dramatically transformed by human action. Further this transformation is dependent on an expanding scientific knowledge.

Nevertheless the cognitive and transformational activities are, I maintain, quite distinct, and, closely intertwined as they are in the one concrete act, it is important that we maintain the distinction between them. The cognitive interaction guides the transformational activity and is in turn stimulated by it but is not itself transformational of reality. Cognitive interaction is the making of correlated distinctions within existent reality which is never a reality of a pure "nature" but always a reality transformed and being transformed by the subject's transformational activity.

4.3.6 Commitments, Weltanschauungen and Beliefs

That the kind of factors represented by the cluster of terms, commitments, Weltanschauungen, beliefs, has some kind of significant role in cognition is recognised explicitly by all those studied with the exception of Popper.

In the case of Popper, in spite of his refusal to believe in belief, his own theory can be construed as a belief theory of knowledge. He replaces the language of belief with the language of disposition, preference and conjecture, but this is simply another way of talking about what others talk about in the language of belief, as Popper himself concedes (Popper,1983:23).

His dispute with justificationism is a dispute about the grounds and status of belief, as he might have seen had he not been so anxious to avoid philosophising about belief. The justificationist *assumes* that in order to believe a theory we need grounds that justify the conclu-

sion that the theory is true. Popper argues that this is an impossible requirement. In its place he proposes that we should believe a theory, not as true but as the presently preferred approximation to the truth, on the ground that it meets the appropriate critical tests better than any available alternative. The justificationist requires belief to be grounded in rational justification whereas Popper grounds it in rational criticism; the justificationist demands that a belief have the status of truth whereas Popper wants only the best available approximation to the truth.

In spite of these important differences with the classical analytical tradition, Popper retains that tradition's limitation on the role of belief in a theory of knowledge, a limitation that betrays its positivist ancestry. Epistemological discussion of beliefs is restricted to discussion of belief propositions that correspond to knowledge propositions. Characteristically it is a discussion about the relation between A knowing that p and A believing that p with the assumption that if belief is to be legitimate it must have rational foundations. It is within the implied limits of this restrictive framework that Popper takes issue with justificationism.

Polanyi proposes the complete overthrow of this view by denying all rational foundation to belief, arguing, on the contrary, that all rationality has fiduciary foundations. In doing so he opens up the epistemological discussion of belief to embrace all possible beliefs that a person may hold within a structure of commitment as the matrix out of which knowledge emerges. On this view the debates of the analytical tradition about whether knowledge entails belief become meaningless since knowledge is the product of belief.

Piaget's approach is different again. He gives little if any place to belief within the structure of knowing. Knowing results from the employment of rational instruments that conform to a universal logic

inherent in the organism. However, in the last stages of the ongoing development of his theory he introduced the qualification that this rational knowing activity takes place within a socio-historical framework of beliefs, a Weltanschauung, that conditions the subject's employment of these rational epistemic instruments, directing the knowing activity in this direction and cutting off that direction.

Beliefs are thus introduced into Piagetian epistemology neither as propositions corresponding to knowledge propositions after the manner of the analytical tradition, nor as the matrix of knowledge, in the manner of Polanyi, but as a Weltanschauung that constrains the knowing activity without either influencing or modifying the internal functioning of knowing.

The restrictive view of belief in the analytical tradition, continued by Popper, is clearly unsatisfactory. Beliefs do not occur in isolation but only within a complex belief network of mutually interdependent beliefs.

Quine and Ullian (1973:59-61) unwittingly illustrate this when they describe Tertullian's famous statement "I believe because it is absurd" as incoherent. The quotation appears to be less than precise; something like "I believe because it is foolish" would be more accurate (van der Walt,1978:92,93). However, this does not affect the substance of the present argument. The charge of incoherence made by Quine and Ullian rests on an understanding of Tertullian's statement within their own belief network.

Quine and Ullian operate with a belief network in which any belief about a particular state of affairs is coherent only if it has a logical coherence with a rational foundation. Given this belief network, to say "I believe that p" without rational grounds is doubtful but to say "I believe that p because it is irrational", or words to similar effect, is clearly incoherent.

If, however, we understand Tertullian's statement with his own belief network the situation is quite different. In this belief network, it seems, Tertullian held that a belief about a matter of Christian faith is coherent if, and only if, it is coherent with other beliefs of Christian faith that form a belief network that is not merely incommensurable but incoherent with rational systems external to that faith. Viewed within this belief network Tertullian's statement is thoroughly coherent.

We may challenge Tertullian's belief network in this respect, as I do, with the result that we will not share his willingness to believe a particular state of affairs on the ground of its foolishness. We may also advance reasons for rejecting that belief. However, it does not advance rational discussion to ignore it, content with declaring categorically that Tertullian's assertion of belief about a particular state of affairs on the ground of its foolishness is incoherent because of its incoherence within our different network of beliefs.

While ever we ignore or fail to take the trouble to understand another's belief network it is all too easy to think we have exposed a fatal logical flaw in another's argument when all we have done is exposed a difference in belief. The illusion is often strengthened by the applause for the irresistible logic of our argument by those who share our belief network.

Insufficient attention to the role of the belief network as the context within which any particular statement is to be understood can also lead to a mistaken claim of alliance with another person. Polanyi provides a striking example of this when he cites Luther's famous declaration "Here I stand and cannot otherwise" as an assertion of the rational independence of a person obeying that person's "obligations laid down for himself by himself" (Polanyi,1962:308). In this way he makes Luther an ally for his own theory of commitment.

Yet, if we examine the belief network within which Luther made this assertion it is clear that he is no ally to Polanyi at all. When viewed within his own belief network Luther's famous declaration was no assertion of commitment to self-set obligations but was a response of faith to the Word of God. Luther believed that God has revealed himself by his Word so that faith is a response to that Word. His famous declaration was a declaration of submission not to self-set obligations but to a divinely given Word. Judged by Luther's belief network Polanyi's commitment to self-set obligations is not an act of faith but of unbelief.

Polanyi may dissent from this belief of Luther's and, in that dissent, assert that what Luther was really doing was declaring his commitment to self-set obligations even though he believed he was doing something else. However this does not make Luther his ally. On the contrary, it underlines the fundamental difference of belief between them that sets them not side by side but on opposing sides of the argument.

Recognising the existence of this belief network, within which any particular belief always exists in a complex network of interdependence with other beliefs reaching far beyond the immediate issue of belief with regard to a particular state of affairs, the question remains as to the nature of the relation between knowledge and belief. Is Polanyi right in founding knowledge in unproven belief? Or is Piaget right in asserting belief as a Weltanschauung exerting only external restraint on knowing? Or is the relation of some other kind?

In attempting an answer to this important question an important first step is to clarify the distinction between knowledge and belief. While the two are closely related they are nevertheless quite distinct and a failure to clarify the distinction often clouds the discussion of their relationship.

I have suggested that knowledge is to be distinguished by the making of correlated distinctions within a lawful structure of reality. Belief, on the other hand, is qualified as a subjective assurance with relation to this lawful structure of reality including, in the case of "religious" belief an assurance about the origin and goal of this lawfully structured reality. An assertion "I know that p" is an assertion of the correlated distinction signified by p. The assertion "I believe that p" is an assertion of my subjective assurance concerning p.

This does not mean that an assertion of belief is no more than an assertion about the subject's state of mind. On the contrary, it is an assertion of the subject's assurance that the state of affairs specified by p is so independently of the subject's state of mind.

It is to be noted that it has not been claimed that belief entails certitude. In fact, I maintain that it does not. In its strongest form belief may carry certitude but there are many cases of genuine belief in which there is a subjective assurance short of certitude. Belief occupies a wide spectrum between a weak and unstable assurance and the strongest certitude.

An observer may state a genuine belief that the bank robber wore a brown jacket and yet, if pressed, say "I am not at all sure but I believe so". Faced with the strong contrary belief of other observers such a belief may be abandoned altogether without calling in question the genuineness of the original belief. On the other hand, another observer may state the same belief with an absolute certainty that is unshakeable. We may place more weight on the second belief than the first - depending on our assessment of the credibility of the believer - but we can hardly question that each is an example of belief.

In asserting that all knowledge entails belief, therefore, it should be clear that I make the assertion in its weak form; knowledge entails

belief, not certainty, though with constant endeavour to maximise the degree of certitude of the entailed belief It seems to me impossible for A to know that there are monkeys in the garden if A does not have some measure of assurance that monkeys are in the garden.

On the whole it seems to me that Armstrong (1973:137-149) meets the objections to this view satisfactorily though I am doubtful about his category "unconscious belief". Those cases where Armstrong relies on this explanation seem to me to be better explained by recognising the existence of an extremely weak belief involving a very low level of assurance and leading to a reluctance to assert the corresponding knowledge with any conviction.

Every matter of knowledge, then, entails a corresponding belief in mutual interdependence with other beliefs within a network of beliefs. Knowledge is, in this sense, dependent on and shaped by the subject's belief network.

But beliefs, in turn, occur within and are shaped by a framework of knowledge. I may believe what I do not know, as when I believe that the sun will rise tomorrow, but what I know always shapes what I believe. A New Guinean highlander, who has never left his highland environment of towering mountains and deep valleys may well believe that the whole world is a succession of mountains and valleys but once he has left these highlands and seen the broad coastal plains his expanded knowledge forces a change in his belief.

The common belief that much sickness is related to the activity of organisms like bacteria and viruses is dependent on the knowledge that such organisms not only exist but are known to exist in association with certain sicknesses.

Belief, of course, may go beyond the existing knowledge. Indeed the belief that there is more beyond the already known is an important motivation to the expansion of knowledge. Yet, in going beyond the

already known belief retains its links with the already known.

This remains so in cases of belief where the reality of what is believed is in dispute. Some people, for example, hold the belief that over recent years extra-terrestrial intelligences have visited the earth; others dismiss this claim as mere fantasy, while still others suspend judgment. Yet the belief does not just float in the air but is linked to the well established knowledge of observations of a certain kind. Whether this linkage is sufficient to sustain the belief will depend on the evaluation of knowledge within a belief network, but that the linkage exists can hardly be doubted.

If I have a strong belief that visits by extra-terrestrial intelligences are highly probable then I am likely to believe that the accounts of the observations in question, or at least some of them, are accounts of such visits. On the other hand, if I believe that such visits are unlikely then I am likely to believe that the observations are to be accounted for in some other way. Or, believing that such visits are possible, but with no view as to their probability, I may hold that the knowledge provided by the observations is insufficient to sustain the belief that such visits have occurred.

In the first two cases the belief or disbelief is directly attributable to differing interpretations of the observed event due to differing belief networks. The third is more complex. The belief network plays an important part in that there is no belief about the probability of extra-terrestrial visits but the decisive factor is the evaluation of the available knowledge as inadequate to sustain the belief that such visits have occured.

The relation of knowledge and belief, then, is not a simple relationship but involves a complex interaction. Knowledge is always shaped by a belief network but belief in turn is linked inseparably to, and shaped by knowledge. It is this complexity that Polanyi disre-

gards in making belief the source of knowledge. Neither belief nor knowledge is the source of the other. They are two distinctive but interacting ways in which the subject relates to the experiential universe; knowing is a way of relating characterised by correlated distinguishing while believing is characterised by subjective assurance. To make either the source of the other is to blur the important distinction between them while to make one or the other autonomous is to ignore their inevitable interactive interdependence.

This leaves us with Piaget's notion of an epistemic framework founded in a Weltanschauung as the belief framework within which knowing occurs. This certainly appears to come much closer to the truth of the matter since it recognises the constraint of a belief network on knowing while maintaining a sharp distinction between knowledge and belief. Yet the notion of Weltanschauung as a socio-historical framework of belief is both too limited and too ambiguous to do justice to what is involved in the belief network within which knowing occurs.

What is required is a careful analysis of the structure of the belief network both in the internal interactions of beliefs and in the interaction between the belief network of the subject and the subject's experiential universe. For the present we must be content with a broad outline of such an analysis; the necessary careful testing by filling in the details of the outline must await another occasion.

In pursuing this analysis I propose, as a matter of convenience, to reserve the term "belief" for "belief that". This implies that a belief may be stated in a proposition but does not require that it must be so stated. A belief may be genuinely held without being articulated. However, I restrict the use of the term "belief" for those beliefs that are capable of articulation in a proposition of the form "I believe that p". In particular, I do not include under "belief" those instances of belief articulated as "I believe in p" where this

expresses a reliance on p. I do this only as a matter of convenience to facilitate the clarity of the argument.

Within the internal structure of the belief network we need to distinguish two categories of belief - existential beliefs and foundational beliefs. It should be noted carefully that as internal structural distinctions these categories neither displace nor conflict with other distinctions that may be made with respect to the interaction of belief and knowledge, such as the distinctions made by Wolterstorff (1976:59-66).

By existential beliefs I mean beliefs about the factual circumstances of the subject's existence including beliefs about an external world as this world relates to the subject's factual existence. Some, though by no means all, these beliefs have the character of common sense beliefs, beliefs that are generally taken for granted as uncontroversial or self-evident. These are often not even recognised as beliefs at all but are taken as simply self-evident perceptions or truths. The belief that there is a chair in the room when I am confronted with the appropriate sensory evidence is an example of such a common sense belief.

The self-evident character that such beliefs have within a belief network makes it easy to sustain the illusion that they are matters of universal, self-evident truth such that they must be believed by any rational subject independently of their relation to a belief network. We see this for the illusion it is when we recognise that what constitutes common sense belief is variable.

The existence of an immaterial, intelligible world distinct from but intermingled in some way with the material world was a common sense belief of the ancient world that left an indelible imprint on the philosophy of the ancient Greek and Hellenistic philosophers. It no longer constitutes part of the common sense belief of today's world;

there are still those who believe that such a world exists but it is no longer a common sense belief.

Even the belief in the material reality of a chair when confronted with appropriate sensory evidence does not stand alone as self-evident since there are those who hold that the chair is nothing but a projection of the mind. Though most of us may find such a belief hard to swallow we can hardly justify dismissing all those who hold such a belief as lunatics.

The most trivial instance of common sense belief, therefore, is dependent on other beliefs. I believe that the chair exists because I believe that, in the appropriate circumstances, my senses are reliable indicators of the existence of a subject-independent reality. This belief in turn depends on further beliefs about the nature of the experiential universe. If this is the case with common sense beliefs it is equally so for all other existential beliefs.

This leads us to the recognition of foundational beliefs as beliefs about the nature of the experiential universe that provide the ultimate foundation for all other beliefs. But within these foundational beliefs there is also a dependence of one belief on another. For example, the foundational belief of Quine and Ullian that any particular belief is coherent only if it has rational foundations, discussed above, rests on the further belief that rationality is the fundamental ordering principle of the entire world of human experience.

However, this does not lead to an infinite regression of belief. Belief finally comes to rest in bedrock beliefs as the deepest level of foundational beliefs; beliefs that rest on no other belief but form the ultimate bedrock of belief. As will be noted later, these bedrock beliefs do have a further foundation, but not in other beliefs.

I am aware that my use of the terms "bedrock beliefs" and "foundational beliefs" and my later use of the term "ultimate foundation" has

dangers but I think that, carefully qualified, they are valuable metaphors. However, I might change the metaphor to that of "core", "inner core", "outer core", without affecting the substance of what I am saying.

In speaking of "foundations" and "bedrocks" I am not endorsing "foundationalism". The "foundations" of which I speak are not such as to give the network of beliefs some kind of logically secure foundation of certitude (Toulmin,1976:163,164; Wolterstorff,1976:24-26). I refer to a fiduciary relationship internal to the subject's belief network, not to a foundation outside that belief network. "Belief b" is founded on "belief a" if "believing b" depends on "believing a" where "depends on" refers to a relation between these beliefs internal to the structure of the subject's believing. For example, that the chair is real is founded on the belief that under appropriate conditions my senses are reliable if, within the structure of my believing, the belief in the reality of the chair depends on the reliability of my senses. It is in this sense, and only in this sense, that I claim that all existential beliefs depend on other foundational beliefs that do not have an immediate factual reference in the subject's experience.

The relation between foundational beliefs and existential beliefs is not that of a simple dependence, however, but involves a mutual interaction in which existential beliefs, while depending on foundational beliefs, in turn play a role in shaping the foundational beliefs. An existential belief that sickness is caused by the activity of evil spirits depends on foundational beliefs that such spirits exist in a causal relation with the material world. On the other hand the development of an existential belief that sickness can be cured by means that have nothing to do with the exorcising of evil spirits has resulted in a modification in the foundational belief concerning the role

of evil spirits in the material world even in those subjects who still retain the belief that such spirits exist.

Within existential beliefs we need to distinguish two types of beliefs. So far they have been discussed only in terms of one of these types, beliefs about states of affairs. There are, in addition, existential beliefs about actions. These are articulated in the form of a belief that a specified action or type of action is good, or right, or appropriate, or desirable, or necessary, or effective and the like, or their opposite values. Like other existential beliefs any particular belief about action will depend on other beliefs and ultimately on foundational beliefs. A belief that it is good to brush one's teeth regularly will depend on a belief about the desirable effect of such action which in turn will depend on a belief that scientific sources of knowledge have a measure of reliability.

Again, however, the relation is not a simple one-way dependence but is a relation of mutual interaction. The abandoning of the religiously founded belief that pain in childbirth is desirable or necessary in favour of the belief that it is desirable to take action to eliminate it - a change in an existential belief about action - led to the expansion of our knowledge on which is founded the current existential belief that certain procedures do relieve such pain and this in turn led to a further change in the underlying religious belief.

In summary, beliefs, with of course disbeliefs, constitute a complex, interactive network characterised by subjective assurance in relation to the experiential universe. An important question, for the present study, is the manner in which the subject acquires, and modifies, the beliefs that constitute this network.

Beliefs are undoubtedly formed by the subject rather than learned. I can learn the formula of belief but I cannot learn the belief itself. To have learned the formula that "man's chief end is to glorify God"

or that a hot stove will burn your fingers is no evidence of having acquired the corresponding belief. The only satisfactory evidence of the belief is an acting with the appropriate assurance.

On the other hand the formation of beliefs does not occur in isolation but only in interaction between the subject and the environment. Three distinct factors interact in the shaping of beliefs - the subject's experience of the lawful structure of reality, the communal beliefs of those human communities to which the subject is attached and the subject's personal commitments.

The persistent experience of water as wet, fire as hot, ice as cold ordinarily provides the basis for the belief that water, fire and ice have these properties. The experience that rain falls only when there are clouds in the sky is usually sufficient to establish the belief that there is some kind of connection between rain and clouds. And most of us will reject an assertion that we should not believe it is raining when we are drenched to the skin in the midst of a thunderstorm.

Yet these beliefs are not formed in empiricist fashion by simple impressions on the mind. Our experiences of reality are themselves shaped by our belief network. I once asked a group of post-graduate students their reasons for believing that the earth is roughly spherical in shape. A number of them responded by saying that their belief was based on personal observation of a curved horizon as though this was quite decisive. They were somewhat shaken when I pointed out that others, in the past at least, have made the same observation of a curved horizon without altering their belief that the earth is flat. There are, of course, other ways of explaining the observation of a curved horizon than by a spherical earth. Nevertheless, the shared experience of the lawful order of reality does provide an important basis for shared beliefs.

Communal beliefs that constitute communal orthodoxy are a second powerful formative influence. Every human community, whether it be a family, or a tribal group, or a church, or a professional community such as a community of scientists, or an informal community of regular drinking partners, or an educational community has its set of communal beliefs that are the test of communal orthodoxy. The degree of pressure these beliefs exert on the individual will depend on factors such as the importance to the individual of communal approval and the degree of dissent that is tolerated within the community, but to a greater or lesser extent the communal beliefs have a formative influence on the beliefs of an individual associated with that community. Since the harmonious functioning of any community requires a certain minimum of shared beliefs related to the shared life of the community the right to participate in the communal life depends on acceptance of these communal beliefs.

This is as true for the scientific community as it is for an ecclesiastical community or a political community. To be recognised as a scientist and have one's work acknowledged as scientific the subject must conform to the currently accepted minimum of beliefs that constitute the scientific attitude or method. Without this there could be no scientific community, indeed no science, but only an indefinite number of individuals doing an indefinite number of things that they individually call science.

In an organisationally undifferentiated society there is commonly a single set of communal beliefs which may be called the Weltanschauung of that society. In a modern, differentiated society the situation is more complex, with a plurality of communities of different sorts each with its own communal beliefs. Any one individual usually participates in several of these communities, with the mix of participation varying from individual to individual.

Where all, or nearly all, the members of such a society are members of one community holding life-encompassing communal beliefs as a strongly enforced orthodoxy, such as an authoritarian church or certain forms of a totalitarian, ideological state, there will still be a high degree of uniformity of belief in the society that can be identified as the Weltanschauung of that society.

However, where there is the pluralism of societal organisation characteristic of much of the 20th century Western world, the communal pressure to belief conformity within a society is reduced significantly, resulting in significant diversity of beliefs. In this situation, while it is possible to identify beliefs that are widely held within the society, these form little more than a common core for a diversity of Weltanschauungen. This is also true for the members of specific communities within that society other than in exceptional cases where membership in a community requires acceptance of a common Weltanschauung.

The modern scientific community undoubtedly has communal beliefs that all members of the community are expected to hold but it is doubtful whether these are of a sufficiently comprehensive nature to justify the term Weltanschauung. They have the more limited role of specifying the minimum belief conditions for recognition as a participant in the scientific community; they provide the ground rules for the communal scientific endeavour. They function in the manner of Piaget's "epistemic paradigm" ensuring the coherence of the communal enterprise by specifying the communally acceptable criteria for the conduct of that enterprise.

This "epistemic paradigm" needs to be distinguished from a Weltanschauung that each member of the scientific community is free to develop or adopt by combining these shared beliefs of the scientific communtiy - the epistemic paradigm - with other beliefs in ways that

may differ widely from individual to individual. Only by this limitation of communal belief allowing for diversity of Weltanschauungen is it possible for an atheist, a Christian and a Muslim, a social conservative and a social revolutionary, a moral puritan and a moral hedonist all to work in relative harmony within the limits of a scientific community.

A difficulty that this situation creates for communal theoretical endeavour, of course, is that an increasing divergence in Weltanschauungen makes it increasingly difficult to sustain agreement about the "epistemic paradigm".

In short, whereas in an organisationally undifferentiated society or a differentiated society dominated by an authoritarian organisation there is likely to be strong pressure on all the members of the society to adopt communal beliefs constituting a Weltanschauung, in a pluralist society the pressure of communal beliefs is fragmented among several communities each of which influences only a segment of the individual's belief network. In this situation there is little communal pressure for a Weltanschauung common to all, or even the majority, of the members of the society.

Nevertheless, interaction between the differentiated communities in the context of the experience of a common lawfully *structured reality* is important in ensuring a measure of commonness of belief within the society. This interaction occurs both through inter-community contact and through the cross-membership of individuals in a number of communities. While we might speak of these common beliefs as a common Weltanschauungen it seems better to speak of diverse Weltanschauungen exhibiting certain features in common.

The third factor influencing a subject's belief network is the subject's personal commitment. The use of the term commitment does not imply an endorsement of Polanyi's use of the term. Commitment is used

here for the grounding of belief in the subject's reliance on an ultimate ground or ultimate grounds of belief. Within the structure of belief one belief rests on one or more other beliefs till we reach a bedrock of beliefs resting on no other beliefs. Yet these bedrock beliefs are not groundless but rest on a ground or grounds in which the subject believes as the ultimate foundation of belief. I emphasise that the relationships of which I speak here are fiduciary relationships wholly internal to the structure of the subject's believing.

This grounding of belief in an ultimate foundation has the character of a commitment of the subject the object of which is always other than the subject, an object constituting for the subject a self-sufficient ground for belief. It should be noted that it is ultimate only as ground of belief and not necessarily ontologically ultimate. The subject may believe, of course, that the ultimate ground of belief is also ontologically ultimate but the lack of a belief about what is ontologically ultimate, or a belief that the ontologically ultimate cannot be known, does not remove the necessity for an ultimate ground or grounds of belief.

As the object of the subject's commitment this ultimate ground of belief is always distinct from the believing subject. It is possible to have a commitment to the subject's self or to the subject's believing only on condition that the self or the believing is objectified as an idea distinct from the subject. In this case it is not the subject or the subject's believing, but the objectified idea of the subject or of believing that is the object of the subject's commitment.

In principle commitment may be either a single commitment to a single ultimate ground in which all belief is founded or a multiple commitment to several grounds, each functioning as the ultimate ground for an area of belief, either as complementary grounds or in a hier-

archy of grounds. A clear example of the latter is the person with a commitment to a rational methodology as the ultimate ground for scientific belief within a hierarchy of commitment that subsumes this scientific commitment under a commitment to the God of Christian confession.

It should be emphasised that not every instance of the use of the word commitment is an instance of commitment in the sense intended here. A stated commitment may be itself grounded in belief or in another commitment and not be the ultimate ground of belief. I may state, for example, my commitment to a political cause as a commitment grounded in the belief that the cause is just and in my commitment to the cause of justice. This belief in turn will be grounded in beliefs about the factuality of the political situation, about political values, and about justice as a fundamental human value. This seems clearly to be an instance of commitment but it is equally clearly not a commitment to an ultimate ground of belief; but is itself grounded in the subject's belief network.

It is important, therefore, that we distinguish commitment in the present sense by qualifying it as ultimate commitment. I do not, however, use the term "ultimate commitment" in the sense criticised by Trigg (1973:43). An ultimate commitment in the sense in which I use the term is decidedly not devoid of associated propositional belief. I argue with Trigg about the impossibility of a commitment without an associated belief that can be stated as a "belief that", though I think it is important to distinguish the commitment from the associated "belief that".

"Ultimate" in this connection means only a commitment the object of which is taken by the subject as an ultimate ground of belief. Or, to get away from architectural metaphors, a commitment is "ultimate" when it functions within the subject's structure of believing to relate

belief to a "reason" for belief that is not another belief.

At this point it may be noted that "commitment" in the sense in which I use it here might also be described as a "believing in". In this wider sense it belongs to the structure of belief.

The ultimate commitment often is not a stated commitment of the subject and, even when a statement of ultimate commitment is given it may not state the real commitment, or, at least, only state it inadequately. An ultimate commitment can be identified adequately only by an analysis that isolates what functions in practice as the self-evident ground of the subject's belief network.

Quine and Ullian, for example, in their discussion of Tertullian show an ultimate commitment to rationality, since this functions for them as the unquestioned and self-sufficient ground of belief. Similarly Popper, in his epistemology, shows an ultimate commitment to rationality, interpreted as critical rationality, as the self-sufficient ground of knowledge. Polanyi, on the other hand, shows an ultimate commitment to belief as the self-sufficient ground of knowledge.

Popper's treatment of Polanyi highlights the role of ultimate commitment in epistemological discussion and, at the same time, the ease with which the issue of commitment may be evaded. He dismisses Polanyi's position as an example of "fideism" which he describes as "the theory that a scientist must have faith in the theory he proposes". He contends, on the contrary, that scientists "often realize that they are proposing conjectures that will, sooner or later, be superseded" (Popper,1983:xxxi, xxxii).

Popper here evades the issue of ultimate commitment by shifting the discussion of the difference between himself and Polanyi onto the ground of factuality. Does a scientist, of necessity, have faith in a theory he proposes or does he, in many cases at least, regard his theory as no more than a provisional conjecture?

This gives the dispute a quite deceptive appearance of a factual dispute that can be settled by examining the facts of the matter: What status do scientists actually give to their theories? If we find even one clear instance of a scientist seriously proposing a theory as no more than a provisional conjecture then Polanyi's theory, as formulated by Popper, is shown to be false.

But Popper's formulation simply evades the real issue. On Polanyi's account there is no reason why a scientist may not propose a particular scientific theory as a provisional conjecture, and no amount of such instances will falsify his theory of scientific knowledge. There is no reason why a scientist must have faith in a particular theory. He can hardly be a scientist without having faith in science and scientific procedures but the status he gives to particular scientific theories will depend on his beliefs about the nature of science and scientific theories.

The key issue is not the status that scientists give to particular theories but the ultimate ground of scientific theorising. Polanyi insists that it is grounded in the subject's beliefs as the self-sufficient ground in which rationality is founded. Popper maintains that theorising is grounded in critical rationality as the self-sufficient ground in which scientific beliefs are founded.

Popper and Polanyi each acknowledges a role for both rationality and belief in scientific theorising. What separates them is that Popper regards rationality as a self-sufficient ground of such theorising in which the beliefs are grounded whereas Polanyi regards belief as the self-sufficient ground in which the rationality is grounded. Their belief in rationality and belief, respectively, as the self-sufficient ground of scientific theorising constitutes an ultimate commitment; Popper is committed to rationality and Polanyi to belief as the ultimate ground of theorising. Whether or not this is their single life

commitment or only one component of a multiple ultimate commitment is a question that we cannot determine at present.

These commitments cannot be falsified by either factual considerations or logical argument. They establish for the subject the ultimate foundation on which all factual considerations and all logical argument rest; the facts and the logic have their force for the subject because of the grounding in rationality or belief, respectively, as their ultimate ground.

This is not to say that these ultimate commitments can never be changed or that factual and logical considerations play no part in such change. A commitment may be changed by varying the properties that are ascribed to the object of commitment and, in extreme cases, by abandoning one object of commitment for another quite different object. Difficulties experienced by the subject as a result of factual or logical considerations may induce the subject to make such change. However this change does not occur because the commitment has been falsified, either by factual or logical considerations, but because the commitment is judged by the subject to be inadequate as an ultimate ground of the subject's beliefs. The whole network of the subject's beliefs, including whatever other ultimate commitments the subject holds as grounds of these beliefs plays a part in this judgment.

Lacking an adequate analysis of the structure of belief Popper, Piaget and Polanyi each gives an inadequate account of the cognitive role of belief in their epistemologies. The inadequacy of Popper's account has been discussed already.

Piaget's notion of an epistemic framework that determines both the problems to be addressed and the acceptable conceptual structure of cognition gives a valuable glimpse of the impact of beliefs on cognition, but it remains inadequate by reason of a too superficial treat-

ment of the nature of belief.

By confining the role of belief to a Weltanschauung, conceived as a set of socio-historical beliefs, Piaget both fails to take account of the complexities of such a Weltanschauung in a modern differentiated society and ignores the importance of personal commitments in the shaping of cognitive beliefs.

At first sight, since he grounds all knowledge in autonomous belief, it may seem strange to charge Polanyi with giving an inadequate account of the cognitive role of belief. Yet his reduction of belief to a framework of commitment fails to do justice to the complexity of belief. Commitments provide the ultimate grounds of belief but the framework that gives shape to belief is forged by a complex interaction between the subject's experience of reality, the communal beliefs of those human communities to which the subject belongs and the bedrock beliefs that link the belief network to the subject's ultimate commitments. Belief is not autonomous but requires an anchorage beyond itself.

4.3.7 The Grounds and Limits of Intersubjective Universality

The failure of philosophers to reach universal agreement is cited by Piaget as a reason for his disillusionment with philosophy as a way of advancing knowledge. Knowledge, he asserts, must command universal assent and this is secured pre-eminently by scientific procedures modelled on the physical sciences. Yet sixty years after he launched his venture in scientific epistemology Piagetian epistemology remains controversial not only among philosophers but among scientists; there are no signs of the emergence of a universal agreement from Piaget's efforts.

After centuries in pursuit of the cognitive ideal of intersubjective unanimity in knowledge we are further from attaining that ideal than ever. Any claim that it has been achieved can only be sustained by

limiting severely the scope of knowledge and, even then, the unanimity of today is liable to dissolve into fierce disagreements tomorrow. The Piagetian enterprise has done no better than others in this respect.

There is not even agreement about how we might attain the ideal. Piaget insists that it can be attained only by a painstaking piece by piece construction as we add to our knowledge, one by one, solutions to strictly delimited problems obtained by agreed scientific procedures. Popper, on the other hand, argues that we advance by the critical testing of bold, creative guesses in order to identify the currently preferred guess. Polanyi leaves us with an intersubjective coincidence of commitment as the only possible basis of intersubjective agreement in knowledge.

While each of these answers is able to admit something of the other two within its own scheme they remain mutually incompatible approaches to the problem of intersubjective agreement in knowledge. If one is correct then the other two are clearly defective.

The persistent failure over many centuries to achieve, or even come close to achieving, the ideal of universal intersubjective unanimity ought in itself to be a strong argument for abandoning the ideal. Such a move is further supported by the analysis of belief outlined above which suggests that universal intersubjective unanimity is unattainable. Historically such unanimity, or the appearance of it, has been achieved only in undifferentiated societies united in a common Weltanschauung or in societies dominated by an authoritarian organisation that uses its sanctions to impose a unanimity in accordance with a communal orthodoxy. As soon as these constraints are removed a diversity of beliefs emerges, generating a diversity of views about what is to count for knowledge. To this extent Feyerabend is right in arguing that unanimity can be secured only by authoritarian means that impose distorting restraints on our humanity.

Had he followed it through with a more adequate analysis of belief Piaget's own notion of an epistemic framework would have led him to recognise that the universal scientific epistemology founded in a universal rationality that he sought is a will-o'-the-wisp. Modern differentiated societies without an authoritarian unifying societal structure are characterised by a tendency to diversity of variant epistemic frameworks that inevitably generate divergent theories. Epistemology is not exempt from this effect of the modern pluralism in beliefs.

However, abandoning the ideal of universal intersubjective unanimity does not require the adoption of epistemological anarchism, fideism, subjectivism or the like. On the analysis given above, while there is no basis for expecting intersubjective unanimity, the knowing subject functions, and can only function, within the context of a universal lawful structure of reality that, without determining either the cognitive activity or its outcome, places that activity within universal lawful boundaries and provides universal tests of the results.

It seems to me that the loss of intersubjective unanimity is not, in itself, a situation to be mourned but is a situation with positive potential. Whether that potential is positively developed remains to be seen. It has positive potential in that the myth of the universal trans-subjective authority of science is challenged and the way opened for the stimulus that can come from the critical interaction of competing theories. The fulfilment of the potential, however, depends on the recognition of a common ground on which this critical exchange can take place.

It is important at this point to recall that reality is not a category external to and independent of the subject. The subject is immersed within experiential reality as one of its constituents. The lawful structure of reality, therefore, is neither a structure of

subject-independent objects nor an internal structure of an object-independent subject, but embraces subject and object in their multiple interactions in a complex, lawfully governed coherence.

The cognitive interactions constitutive of knowledge are no exception. They too occur within a lawful structure of reality that ensures an epistemic base of experience common to all subjects within the same relational field - e.g. the common experience of the greenness of grass or of the rise of mercury in a thermometer as heat increases - and where exceptions occur makes it possible to identify universally recognisable lawful reasons for these exceptions - e.g. the failure to experience green due to the "colour blindness" of the subject. It also provides a universal basis for assessing the validity of logical and mathematical systems as well as for universally recognised logical and empirical tests of scientific theories.

In short the universal lawful structure of reality provides a universal context for cognition that is common to all subjects, ensuring significant areas of intersubjective agreement. At the same time the subject functions in this universal lawful context within an epistemic framework of belief with subjective variables. In this respect Piaget is correct. Knowledge is neither, with Popper, a matter of pure rationality - with subsidiary beliefs - nor, with Polanyi, a matter of pure belief - with a subsidiary rationality. It is a matter of rationality within a framework of belief.

Yet Piaget's account also proves unsatisfactory both in that he internalises in the subject the lawfulness of the rationality and limits the epistemic framework of belief to a <u>socio-historical</u> Weltanschauung.

The subject's epistemic framework is the product of the complex interactions of the subject's belief network, including the ultimate *commitments*, the communal beliefs of communal associations and the

personal experience of the lawful structure of reality. It is, ordinarily at least, a stable framework that directs and shapes cognitive activity in a stable development that ensures the stability and coherence of knowledge. Yet it is not immutable but, depending on the nature of the bedrock beliefs and their supporting ultimate commitments, is always more or less subject to variation and change, in response to changes in the factors that shape the beliefs.

In this respect, though there is not room to develop the suggestion here, the nature of belief change suggests that the development of scientific knowledge is characterised by subtle changes in the epistemic framework in the ordinary course of its development as well as occasional "revolutionary" changes. It seems to me foolish to deny that there have been occasional changes that have been "revolutionary" in the sense of the overturning of major features of an existing belief network but equally foolish to try to limit changes to these dramatic "revolutions".

While, therefore, the universal lawful structure of reality means that all cognitive activity occurs within common, universal constraints ensuring a measure of commonality and common points of reference for testing knowledge claims, the role of individual and communal subjectivities in shaping the epistemic framework limits the extent of intersubjective agreement so that it always falls short of intersubjective universality. Even the agreement secured by communal beliefs within a given community is ordinarily limited by the specific nature of that community with wide dissent occuring among its members on matters beyond the community's concerns - e.g. the communal beliefs of a scientific community ordinarily leave room for dissent among its members on matters of explicit religious knowledge or political convictions.

The claim that there exist incommensurable scientific theories, as

argued forcibly by Feyerabend, for example, is accepted, therefore, only with qualification. Any two theories can be comparatively evaluated against the common measure of a common experience of the lawful structure of reality on condition that:

(i) They each aim to give an account of the same state of affairs within that reality

(ii) We engage in the critical analysis necessary to uncover the common problems underlying differing problem formulations.

This is not to say that there will be intersubjective agreement about the results of the comparative evaluation since the evaluation will be the evaluative act of subjects acting in their full subjectivity. Nevertheless the theories can be brought together - given the above two conditions - for comparative evaluation against a common reference point. It is an abusive use of the idea of incomensurability to use it to deflect a hostile critic's empirical and logical arguments based on a common experience of reality - as, for example, if a scientist discounts refuting experimental data as worthless without careful analysis on the ground that the experiments were conducted by an an adherent to another, incommensurable theory.

This testing against the lawful structure of reality will often require a careful analysis to identify, behind the differing claims, the common feature in the experience of reality of which the two theories attempt to give an account. This may then lead to a testing of the two theories not as they are presented but in terms of underlying common problems.

We can comparatively test Popper's and Piaget's epistemologies, for example, only after such an analysis. As they are presented by their authors they are incommensurable since they appear to deal with quite different problems; one is dealing with the logical structure of

theories while the other deals with the logical structure of the subject's activity. However, when we analyse them more closely we find that each is an attempt to answer common problems of epistemic rationality and intersubjectivity. We can then measure them by employing empirical and logical tests that test them comparatively against a common experience of the lawful structure of reality for their success in dealing with these underlying common problems.

At the same time, while it is thus always possible to devise comparative tests of any theories dealing, either explicitly or implicitly, with the same, or closely related, problems within a common relational field the results of such tests will not always result in unanimous intersubjective judgments. Where there are differences between the theories due to differing ultimate commitments shaping the epistemic framework within which the theories are developed there is always likely to be a residual incommensurability. In this case while comparative tests may lead to the modification of a theory or even to its replacement with an alternative it will not lead the subject to adopt its rival.

4.4 A Beginning

It will be apparent that this outline of a theory of knowledge serving as an evaluative conclusion to this study is itself only a beginning. The outline needs to be developed, filled out, refined and tested. There is little doubt that, in the course of its further development and testing it will undergo further modification.

It does, however, seem to me to offer in its broad outline a way to go forward that will make use of the many worthwhile insights generated by the study of some major contributions to contemporary epistemology within an epistemological framework that makes good the deficiencies that have been identified in each of them. I look to others to assist me in identifying good deficiencies in my own efforts.

APPENDIX: PHILOSOPHY, THEOLOGY AND CHRISTIAN FAITH

This study has been undertaken as a Christian in the conviction that the philosophical endeavours of the Christian, as indeed the whole of life, ought to be informed throughout by Christian faith. Yet it has been written, quite deliberately, without the use of the language of Christian faith. It seems appropriate, therefore, to explain this absence of Christian terminology in a work claiming to be informed by Christian faith and to indicate how that faith has informed the work as presented.

A dominant influence in my philosophical development has been undoubtedly the work of the Dutch Christian philosopher, Herman Dooyeweerd, who, with his colleague, D.H.Th. Vollenhoven, gave a remarkable lead in developing a tradition of Christian philosophy in which my own work continues.

Of the many valuable insights that I have gained from the study of Dooyeweerd's work none is more valuable than the recognition of the importance of a religiously critical attitude; an attitude that, anchored in a firm religious commitment, subjects all things human to rigorous critical tests that probe to the deepest foundations of life. It is an attitude that, not content with the apparent or presumed soundness of ideas in their immediate presentation probes beneath the surface until the deepest foundations on which they rest are uncovered and critically evaluated.

This is an attitude that I have endeavoured to maintain throughout this work and that I hope others will adopt in reading it. It has inevitably lead me to bring Dooyeweerd's own theories under appreciative but critical scrutiny.

A further insight for which I am indebted to Dooyweerd is the recognition that academic activity does not achieve a Christian character by the incorporation of Christian theological or confessional state-

ments - though such incorporation is, of course, not necessarily out of order. Scholarship achieves a Christian character only as the the Christian scholar pursues his scholarly activity, in accordance with the nature of his discipline, as a response in faith to the Word of God.

A first requirement of a work of Christian philosophy requires, then, that it be a philosophical work. Philosophy, as I understand it, is distinguished by the theoretical analysis of the coherence of reality in universal human experience. As such it legitimately includes in the scope of its analysis the confession and theological articulation of Christian faith. However its purpose in doing so is not to offer its own articulation of that confession but to offer an analysis of the place of Christian confession and theology within the coherence of reality.

The philosopher who is a Christian will, as a Christian, confess Christian faith within a Christian community in which that faith is articulated, both in confession and in theology. Within that community he will quite properly, as a philosopher, enter into critical interaction with Christian theology, stimulating the theologian to greater faithfulness in their common faith in theologising and being stimulated in turn to greater faithfulness in philosophising. In this interaction the philosopher may well point out to the theologian areas in which theology has been distorted by the influence of philosophical analysis informed by religious principles alien to the Christian faith, and receive reciprocal challenge with regard to his own philosophising from the theologian based on his special theological competence. So far as the philosopher may be also a theologian this interaction will take place also within his own thought.

But it is important that this kind of interaction between the philosopher *and* fellow members of the Christian community should not be

restricted to an interaction with theologians. In order to maximise the Christian character of his philosophising the philosopher needs to interact wherever possible, in direct relation to his philosophising, with all who share with him a common Christian faith in order that his philosophical work may be most effectively informed by the Word of God.

Yet in his philosophising, as I see it, it is not the task of the philosopher to give theoretical articulation to Christian faith as confession or as theology, but to offer an analysis of the coherence of reality that holds good not just for the Christian community but for all human experience. In this philosophical analysis, Christian community and Christian theology will take their place, as they should in any philosophy, as particular instances of confessional community and the theoretical articulation of religious confession respectively.

This is not at all to say that it is illegitimate for the Christian philosopher to incorporate explicit statements of Christian faith as statements of his faith in his philosophical writing. There are times when it will be important to do so and, indeed, it is precisely what I am doing in this appendix which I regard as an integral part of my philosophical work.

That I have reserved for an appendix these observations in which I make my Christian faith explicit is not because I regard them as lying outside my philosophical activity proper. In principle these comments might as well have been incorporated in the main text. I have chosen to write the main body of this work without the use of the terminology of Christian faith because it seems to me important for the Christian philosopher working in a secular context to communicate what I trust are ideas with a Christian character so far as possible in the language of the secular philosophical world. An important model for me in this respect is Paul's Areopagus speech as recorded in Acts 17:22-

31. While the content of this speech is profoundly Christian, the language that Paul used, so far as I can judge, is entirely devoid of terms or references peculiar to the Christian community but is the language of the pagan audience which he was addressing. It is in the interest of achieving a similar level of communication with today's secular philosophical world, and wholly for this reason, that I have avoided the use of language peculiar to the Christian community in the main body of this text.

However, this leaves the question of the Christian character of the philosophy. If a work is devoid of explicitly Christian content in what sense, if at all, can it be Christian? Must it not then be a natural philosophy founded in a natural reason that, at best, is compatible with Christian faith?

Such a conclusion, which has not been uncommon in the Christian tradition, assumes that philosophy, and other areas of theoretical activity, can only be informed by the Word of God by the incorporation of explicitly Christian content in its conceptual structure. This, it seems to me, rests on a fundamental misconception of the way in which the Word of God is related to human theoretical activity, and, indeed, to human life in general. It is absolutely crucial, in my view, to distinguish clearly between God and his Word, on the one hand, and the creation in and through which that Word comes to us, on the other hand. Any blurring of this disinction can only tend to either an idolatrous divinising of the creaturely, or a reduction of the divine to the creaturely.

With regard to the person of Christ it is a fundamental part of the universal confession of the Christian church that he is both fully divine and fully human without any confusion of the two. During his life on earth, then, anyone who met Jesus of Nazareth met the God the Son; the man Jesus and God the Son are inseparable. Yet any analysis

that might be made of this person Jesus could only have revealed human qualities such as might be found in any other man. Only the creaturely could be the object of human analysis; the divine, as that which in its nature is distinct from and transcends all creaturely categories, could not be brought within the scope of that analysis. To suppose it could would be to reduce the divine to the creaturely. The only response that men could make to God the Son, whom they met in meeting Jesus of Nazareth, was either that of submission in the obedience of faith or the rejection of unbelief.

It seems to me of the utmost importance that we maintain the same distinction with regard to the Word of God that comes to us in and through the creaturely text of Scripture. We may analyse, abstract from, and conceptualise the text of Scripture as we would any other creaturely text but we should not think that in doing so we are analysing, abstracting from, and conceptualising the Word of God. As the divine Word it is beyond all our creaturely categories and can only be responded to in the obedience of faith or the denial of unbelief.

This is not at all to say that it is not important to use every means at our disposal to arrive at the best possible understanding of the text of Scripture. It is of the greatest importance since it is in and through that text that the covenant-redemptive Word of our God comes to us. It is inseparable from though, like the person of God the Son in relation to Jesus of Nazareth, not to be confused with that text.

To wrestle with the problems in the understanding of Scripture in its relation to theoretical activity, as, for example, Spykman (1985) and Duvenage (1985) do, is a crucial component of Christian scholarly activity. However, when we begin to speak of the incorporation of the use of "Scriptural data" in science (Duvenage,1985:22-24) we move into

territory where where we need to move with great care lest it be thought that a diligent use of Scripture, with attention to the right hermeneutics, yields some kind of divinely sanctioned data for incorporation in our knowledge.

All our analysis and scholarly attention to Scripture and the understanding of its text can only be concerned with the creaturely text as that in and through which God's Word comes to us. It does not give us possession of that Word as something to be incorporated in our knwedge in the form of data or concepts or principles or in any of the other creaturely categories of which are knowledge is composed. The Word of God is not for us to take possession of and use but that which must take possession of us and direct our actions as we respond to the text of Scripture in faith.

There is in this respect, it seems to me, a danger in Dooyeweerd's identification of "creation, fall and redemption by Jesus Christ in the communion of the Holy Ghost" as the religious ground-motive for Christian life and thought as the content of the "Divine Word-Revelation" (Dooyeweerd,1953-8:Vol.I:61,173-177). It implies, or at least can be readily taken as implying, that the content of the Word of God can be encapsulated in a conceptual formula and so be incorporated as a component of our creaturely knowledge.

The Divine Word-Revelation that is the basic motive of the Christian religion is certainly rich in content to which Christians ought to respond in confessional statements and theological formulations, as well as in other ways. But it is important to keep clearly in view that such confessions and formulas are always of the nature of responses to the Divine Word-Revelation, and can never be in any way identified with, or an encapsulation of, the content of that Revelation. The full content of that Revelation can be nothing less than the person of God revealed in the concrete reality of his creative/redemptive acts,

a content too rich to be encapsulated in any conceptual formulation.

I am conscious that, in principle, this distinction was well recognised by Herman Dooyeweerd and has continued to receive recognition in the philosophical tradition with which his name is so closely associated and in which I work. I reiterate the principle here, however, and endeavour to sharpen it further because I fear that there is a real danger of failing to give it adequate recognition in practice.

The development of Christian philosophy with genuine reformational power, then, does not depend on the incorporation within it of concepts, principles or propositions that have the status of divine certainties or even of divine givens. Even were this to be attempted by incorporating texts of Scripture this would not be incorporating the Word of God in the philosophy; the Word of God comes to us only in Scripture in its integrity and not in passages which we extract to incorporate in another context. Philosophy can develop as Christian philosophy only as the philosopher philosophises with the conscious purpose of faith to listen for and respond with the submission of faith to the Word of God at every turn he takes in his philosophising. It is in this way that I have endeavoured to pursue my task in the present work and in that sense that I offer it as an endeavour in Christian philosophy.

It remains only to indicate some of the specific ways in which I believe that the philosophical analysis here presented has been informed by the inscripturated Word of God. For this purpose I offer the following outline of the basic contours of the distinctively Christian orientation within which this study has been conducted and through which, I believe, it has received a distinctively Christian shape.

The world of human existence is taken to be one world exhibiting the same fundamental structure, throughout all the diversity of human existence, as the creation held together and reconciled in God the Son

through whom and for whom it is created (Colossians 1:15-22). Among other things this is fundamental to the understanding of philosophy as the giving account of the coherence of a reality common to all mankind as discussed earlier in this appendix.

Secondly, this one world is lawfully structured not as a rational, or fiduciary, or organic, or physical lawfulness but by the lawfulness of the Word of God that, as the law for the creation, transcends and secures the lawfulness of every mode of creaturely functioning (Psalm 33; 119:89-91; 147; 148; Hebrews 1:1-3). This leads to the expectation of a lawful structuring in all our experience of reality the source of which cannot properly be located in a law either within the knowing subject or in the objects of that knowing.

It means that Popper's critical rationality, Piaget's organic rationality and Polanyi's fiduciary commitment must each be rejected as the central ordering principle of our knowing since each is but a mode of the lawfully structured functioning of reality under the lawful authority of the Word of God. It leads also to the rejection of the notion that a particular manner of knowing, such as the scientific, can be the key to knowledge since the key and unity of knowledge lies in the religious unity of life to which all the diversity of our knowing is subject.

In this respect it seems to me that the notion of the divine law for the creation as some kind of ontic category distinct from both God and creation is a mistake (Taljaard,1976:42-47; Spykman,1981:176-181; Hart,1984:40-54). It assumes that God's lawful rule over the creation is mediated by laws that, though originating in him, are distinct from him, so that we must conceive of divine law as a category distinct from the personal presence of God if it is not to be confused with the creation.

But such a conception of law as mediate between God and his creation

is, I suggest, alien to the revelation of God through the Scriptures as the God ruling all things by his active, personal presence in the creation. He is a God distinct from the creation yet never distanced from it. The lawfulness that we experience in the structuring of creation is not secured by a set of laws distinct from God but by the faithful constancy of the authority of his rule achieved directly by his own active presence in the creation through his Word and Spirit. The law for the creation is the righteous authority of God's rule administered personally by the Son through the active presence of the Spirit.

What I have said about the person of Christ and about Scripture holds good in this respect also. God reveals himself to us in his lawful ordering of all creation but the ordering presence of God must always be kept distinct from the structure of creation in which he is revealed. It is partly for this reason I have insisted that, while we gain insight into the law for creation through our experience of its structure we cannot conceptualise the law but only our experiences of the structure to which that law gives effect. I believe this is crucial if we are not to risk losing the sharpness of the distinction between the divine and the creaturely. Thirdly, this study has been informed by the understanding that humans have an authority and a calling not merely to care for but also to subdue and cultivate the creation (Genesis 1:26-30; 2:15). If, on the one hand, we cannot shape our lives any way we will but only within lawful boundaries, on the other hand, human life is not fulfilled by conformity to a predetermined order but only by a creative ordering, a creative constructivity, within the given lawful boundaries. This leads to the recognition that knowing is not to be restricted to a discovery or uncovering or even an unfolding of an order already built into the object world but includes a constructive activity of the subject, always within given