UNDERSTANDING LINGUISTIC AND HERMENEUTICAL FOUNDATIONS OF GENETIC EPISTEMOLOGY

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By

Ms. ROSHIDA REGINA RODRIGUES

Under the Guidance of

PROFESSOR A.V.AFONSO (GUIDE)

HEAD, DEPARTMENT OF PHILOSOPHY

GOA UNIVERSITY

&

DR. MILAN DESAI (CO-GUIDE)

DEPARTMENT OF PHILOSOPHY

GOA UNIVERSITY.

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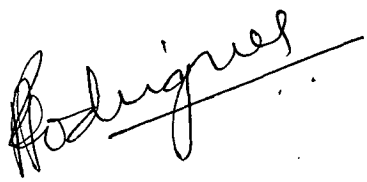
(R. C. PRADHAN)

Guide.

DECLARATION

I, Ms. Roshida Regina Rodrigues, hereby declare that this thesis entitled '**Understanding Linguistic and Hermeneutic Foundations of Genetic epistemology**' is the outcome of my own study undertaken under the guidance and supervision of Professor A.V.Afonso, Head, Department of Philosophy, Goa University. It has not previously formed the basis for the award of any degree, diploma or certificate of this or any other university. I have duly acknowledged all the sources used by me in the preparation of this thesis.



Roshida Regina Rodrigues

CERTIFICATE

This is to certify that the thesis entitled, ***Understanding Linguistic and Hermeneutical Foundations of Genetic Epistemology*** is the record of the original work done by Roshida Regina Rodrigues under my guidance. The results of the research presented in this thesis have not previously formed the basis for the award of any degree, diploma or certificate of this or any other University.

Professor A.V.Afonso (Guide)
Head, Department of Philosophy,
Goa University

PREFACE

I was a student of Professor A.V. Afonso during my Post-Graduate Course in philosophy at Goa University, during 1997-99. Once, after completing my master's degree, I had a discussion with him about doing research under his guidance. It was his suggestion that I could do a study related to this area. The constant guidance and motivation from my guide encouraged me to embark upon such a daunting task. I would like to record my indebtedness and sincere gratitude to him, who not only motivated me to enroll but also took a great deal of interest in my study all through in spite of his busy schedule. His guidance, suggestions and constructive criticisms instilled confidence in me. He made me to realize the implications of the position that I have taken up in the thesis at a deeper level than I initially thought. He patiently went through the entire manuscript offering necessary changes to be incorporated. I sincerely thank my guide for helping me during the time of my sickness.

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CONTENTS

INTRODUCTION

The present study is located in the traditional debate between the rationalist and empiricist in the contemporary context of two methodological frameworks, the phenomenological and the analytic. In fact, the rise of analytic philosophy and the phenomenological approaches to philosophizing is historically seen as autonomous and mutually exclusive modes of philosophizing. Recent studies however, seem to suggest that this mutual exclusiveness of philosophical methodology (or distinctive modes of reasoning) is unacceptable and further suggest that there may be a 'continuum' between analysis and phenomenology. In other words, it may be possible for the critics of phenomenology and /or analysis to sift elements of 'phenomenology' in 'analysis' and similarly observe conceptual analysis in phenomenological interpretation. It is therefore not improper to label a philosophical discourse as more or less phenomenological or more or less analytic.

The debate at methodological level is often seen as devoid of substantive or ontological issues. Epistemological problems devoid of ontological content tend to disregard the entire historical context. In the context of rationalist-

empiricist debate, traditional epistemology is seen as normative speculative and unverifiable, whereas contemporary epistemology will have to look for and be dependent upon scientific investigation even of experimental kind. It is in Jean Piaget that such an investigation is available; which attempts Kantian mediation between the rationalist and the empiricist. The focus of the present study will be such mediating philosophies that bring about a 'meshing' of rationalism and empiricism, phenomenology and analysis, etc.

A critical study of Piaget genetic epistemology will constitute the major part of the present study. Piaget has always consciously and explicitly seen himself as a genetic epistemologist and not merely a child psychologist. By epistemology in general he means that area which involves the question of fact. Thus, epistemology is not to be confused with psychology. There are important differences that Piaget makes between genetic psychology, child psychology and genetic epistemology. Genetic epistemology is not to be confused with genetic psychology and genetic psychology is not identical with child psychology. Child psychology is the study of the child himself, genetic psychology seeks within the study of the child, the solution to general problems such as those of the mechanism of intelligence, perception, etc., for it is only in analyzing the formation of such mechanism that we can provide their causal explanation, whereas genetic epistemology has as its object the examination of the formation of knowledge itself, that is to say, of the

cognitive relations between the subject and object. Thus, it bridges the gap between genetic psychology and epistemology in general, which it helps to enrich by considering development. Traditional philosophical epistemology always believed to be normative, speculative and unverifiable, but Piaget believes epistemology can become scientific in nature and thus empirical and verifiable.

Piaget's theory of epistemological development is found in the process of explaining why he does not accept the traditional conception of epistemology, He also tries to explain what should be the proper task of epistemology. The Anglo-Saxon epistemology was mainly concerned with the nature, scope and conditions of knowledge in general. They never accepted any connection with science and epistemology. Scientific problems were mainly the problems of philosophy of science. The type of problems they dealt with were 'elliptical pennies', 'the look of tomatoes and envelopes' or the nature of propositions such as 'bachelors are unmarried males', etc. Piaget on the other hand, believed epistemology as fundamentally tied up with the growth of science.

Like Popper and Quine, Piaget, agreed that there is a crucial relationship between epistemology and science and that no sharp line separates philosophy and science. But there are important differences between the two. Popper

believes that science can be separated from non-science on the ground that scientific theories are falsifiable, whereas non-scientific ones including philosophical are not. Thus, Popper maintained that science is distinguished from non-science not by its subject matter but by its methods. Piaget believes that science and philosophy cannot be demarcated by their problems. But they do differ both in their scope and in their methods. Philosophy takes as its field the whole of reality (both external and internal) and all relations between external and internal reality. Science takes much limited and manageable object and it pursues very particular and modest questions about restricted domains, since it investigates only those questions that can be dealt with a method which involves formal logico-mathematical deduction or experimentation and empirical verification. In philosophy there is no agreement between individuals, even if there is, this agreement is fortuitous and not objective. Problems therefore do not distinguish philosophy from science. Knowledge involves experimental verification or deductive reasoning, and this, Piaget feels is missing in philosophical knowledge. It therefore follows that there can be no such thing as distinctively philosophical knowledge and no philosophical modes of knowing are superior to science.

Epistemology has as its object, the investigation of the growth of knowledge and it is ultimately tied to the evolution of science and has both normative and

factual dimension. To understand genetic epistemology, we have to look at the methods employed by scientific and genetic epistemology. Scientific epistemology is different from philosophical epistemology in the sense that philosophical epistemology employs three methods: direct analysis, formal analysis and genetic analysis. Direct analysis attempts to determine by simple reflection the conditions of knowledge lying at the bases both of certain scientific views and scientific crisis. Formal analysis utilizes the methods of direct analysis and employs various formalized techniques of logic to investigate and assess questions of normative validity in epistemology. Genetic analysis employs both direct analysis and formalization, but in addition attempts to understand the process of scientific knowledge considered developmentally. It also employs empirical methods to answer empirical questions. Piaget believes that there are two sub-varieties of genetic analysis, that is, Historico-Critical Method and Psycho-genetic Method.

The Historico-Critical Method uses historical re-constructions in history of science to answer epistemological questions concerning the conditions of knowledge, for example, the role of induction in science. One would proceed by looking how scientist has in fact employed inductive methods in their research and theorizing. Genetic analysis in genetic epistemology by combination of psycho-genetic analysis attempts to determine the

psychological conditions of the formation of elementary knowledge and to co-ordinate these results with the study of the conditions of formalization.

Genetic epistemology is concerned with a broader subject matter, pre-history and the intellectual history of the infant, and uses more extensive methods including formalistic analysis and psychogenesis. Thus we can describe genetic epistemology as the function of its development, that is, the attempt to explain the passage from stages of lesser knowledge to the states of more advanced knowledge.

Thus, genetic epistemology *a la* Piaget will be able to integrate the two smilingly divergent trends in philosophy of language that looked into the questions of understanding of meaning and the questions of historicity of language. The questions of understanding of meaning to a large extent depend on conceptual analysis and the question of historicity of language translates itself into the problems of hermeneutical traditions. Again the questions of ontological significance of language cannot be separated from the recognition that human beings have a common heritage which evolves from the man's capacity to interact with each other and the world around. It is in an 'extended' Piaget that we shall be able to reject the traditional epistemological scheme of subject-object dichotomy and consequently bring about a unified

epistemological framework. The following broad themes will be studied in detail for the purpose of lying bare an argument and justification for the above thesis.

The present study consists of five chapters. In the *first chapter* entitled ***'Understanding Knowledge Claims'*** an attempt is made to critically evaluate certain epistemological positions that are both relevant to the present study and those that are deemed fundamental to the understanding of genetic epistemology. The central epistemological problem, namely, 'what is it to know?', and subsequently, the attempts to define knowledge, are recognized as pre-requisite to understanding of the main problem of the present study. After conducting a critical study of classical foundationalism and coherence theory of truth, it has been argued that coherentism directs attention away from the individual's struggle to construct his own epistemology - which is the classical conception of the epistemological enterprise - instead it gives a sense to the notion of knowledge as a social phenomenon, something that can be shared and which can increase by means of that sharing. Coherentist start from the traditional egocentric problem of what each of us is justified in believing. In this respect they don't diverge from the tradition except in failing to insist that the initial data are restricted to basic facts about one's sensory states. Coherentist also provides a possible justification of induction,

and offers a general stance from which the skepticism can be defused, if not rebutted.

In the *second chapter* on '***Language Thought and Reality***', a study of 'linguistic basis of all philosophical thought' is conducted. It is argued that not only language is condition for philosophical thought but it is also a necessary condition for all thought/s. In this chapter, after studying the origin of language, the relation between language theory and evolution is also evaluated. And finally, a discussion on 'language and reality' is carried out with a view to re-establish a Kantian philosophical framework via language as contemporary route to 'Kantian metaphysics' starts not with the theory of knowledge, but with the theory of language. People construct theories of world that are influenced by the language of their community. It may be claimed that a language is a classification and arrangement of the stream of sensory experience and that the world is presented in a kaleidoscopic flux of impression which has to be organized by our minds and this means largely by the linguistic systems in our minds. Most contemporary linguistic philosophers hold the view that it is language that helps us to construct the world itself. It is language that constructs theories, that is, out of experience. Radical philosophers of science like Kuhn and Fayeraband are also relativistic Kantians.

A critical study of Piaget's general philosophical framework is carried out in *chapter three* entitled ***"Jean Piaget and Philosophy".*** After a brief historical analysis, a detail discussion on Piaget's understanding of 'stages' of development is presented in order to explain the key concepts of 'law of decantation', 'perception to thought', 'internalization of action', 'irreversibility to reversibility', 'grasping of consciousness', 'law of temporal displacement' and 'reflective abstraction'. These discussions will help to clarify the fundamental concepts of genetic epistemology namely *assimilation, accommodation* and *equilibration.*

In the *fourth chapter* entitled ***"Piaget's Epistemological Contribution",*** a detailed analysis of Piaget's genetic epistemology is carried out and compared to traditional and contemporary contributions to epistemology. Most significant discussion of Piaget's epistemology is in relation to Kantian philosophy, and the same is reflected in the fact that Piaget seems to construct a 'Kantian transcendental psychology', i.e. conditions which makes human experience possible, those apriori elements that are necessary conditions of experience. Highlighting Piaget's commitment to a biological epistemology, it has been argued that epistemic progress is paradigmatic to 'orthogenesis' and hence, explainable in terms 'organisms', adaptation to environment.

In the fifth and *Concluding Chapter* entitled ***"Implications of Genetic Epistemology"***, Piaget's philosophy in general and genetic epistemology in particular is compared and analyzed in terms of contemporary philosophers of science such as K. R. Popper, T. S. Kuhn, W. O. Quine, and others. It is in this comparison that one can argue for the justification of autonomy of consciousness without falling into the trap of dichotomy of dualism. The comparison also makes possible a defense of consciousness based upon development of language. And finally, one can argue that genetic epistemology of Piaget does not commit genetic fallacy, like contemporary philosophy of science. It is in this context that one can conclude that genetic epistemology is concerned with advancing a theory and explanation of growth of knowledge in the individual and provide an account that is rational reconstruction of the growth of knowledge in the individual, just as philosophy of science provides a rational reconstruction of the growth of knowledge in the collective realm. Genetic epistemological model would be 'tested' against evidence obtained from genetic psychology just as the history of science provides evidence for evaluating philosophy of science. Thus, in an important sense, genetic epistemology can be said to make claims about genetic psychology, claims that require checking. Thus both philosophy of science and genetic epistemology make normative claims about epistemic

adequacy, justification, progress, etc. Both attempt to improve one's epistemic conditions and try to facilitate even further epistemic growth.

Chapter I

UNDERSTANDING KNOWLEDGE CLAIMS

The term 'epistemology' comes from the Greek 'episteme', meaning 'knowledge' and 'logos' meaning roughly 'study', or 'science of'. Epistemology or the theory of knowledge is the study and justification of beliefs. When anyone deals with analysis of knowledge the question that arises immediately is 'What is knowledge?' One may begin to answer the preceding question by noticing the ambiguity of the word 'know'. Consider sentences for instance, '*I know John*', '*I know the city*', '*I know how to play organ*' and so on. In the above mentioned sentences the meaning of the word 'know' differs.

Thus if one wants to find out what man has when he has knowledge, he must first sort out the different senses of the word 'know'. In one sense 'to know' would mean to have some special form of competence (ability). For example ' *I know how to play the guitar*'. Thus if a man is said to know how to do something, it is this competence (ability) sense of 'know' that is usually involved. Another sense of 'know' is that in which the word means 'to be acquainted' with. For example when I say, that '*I know John*', it means that '*I am acquainted with John*'. The third sense of know is that in which 'to know' means to apprehend that something is information. For example, if I know that '*the neutrino has a rest mass of O*', then I apprehend that this is information, namely, that '*the neutrino has a rest mass O*'. This sentence however, involves 'information sense' of the

word 'know'. It is often affirmed that to know something in the other senses of 'know' entails knowledge in the information sense of 'know'.

Hence, the information sense of the 'know' is often implicated in the other senses of the word.

The information sense seems to be fundamental to human cognition and is required both, for theoretical speculation as well as practical investigation. To indicate the information sense of the word 'know' as being the one in question, and to say what that sense is, seems to be different from giving an analysis of the kind of knowledge we have picked out. Two types of propositional knowledge can be distinguished; one is the non-empirical or a priori knowledge that is independent of, prior to any experience, and that requires only the use of reason. Examples of such knowledge include knowledge of logical truths such as the law of contradiction, as well as knowledge of abstract claims such as ethical claims or claims about various conceptual matters. Empirical or aposteriori knowledge is possible only subsequent, or posteriori to certain sense experiences, for example knowledge of the colour or shape of physical object or knowledge of geographical locations. Epistemologists have "often identified the task of analysing what a word means with that of analysing what it denotes"[1]. For example, some philosophers have supposed that to analyse the meaning of the word 'good', would be to analyse the kind of goodness denoted by the term used in that sense.

[1] Keith Lehrer, *Knowledge,* Clarendon Press, London, 1974, P. 3.

It is observed that much of this confusion is mainly generated by the term 'analysis' itself.

Thus the first thing to be clarified is the question 'what constitutes an analysis of something?' An analysis is always relative to one's objective. Without stating the purpose of 'analysis', it makes no sense as to what such an analysis is supposed to achieve. It is like demanding blue prints without saying what one hopes to build. Thus before asking for an analysis of either knowledge or of the meaning of the word 'know', one must be able to explain what goals one hopes to achieve with such an analysis or else one cannot sensibly expect an answer.

Considering the distinction between analyzing the meaning of the term 'know' in the information sense of that term and analyzing the kind of knowledge denoted, Keith Lehrer explains this difference as follows: "a man who is seeking an analysis of the meaning of that term may have some theory of meaning in which part of a complete theory would involve a theoretical explication of the meaning of that term. For example, one might have a theory of meaning designed to assign semantic interpretation to strings of words in order to explain how a speaker communicates with a listener, how a listener understands what is uttered by a speaker, and how a speaker understands his own words. An analysis of the meaning intended to fulfil the objectives of such a theory belongs to a theory of semantics"[2].

[2] Ibid.... P . 5

A.J. Ayer states that "many philosophers have been interested in the task of analyzing the meaning of the word 'know' and some have argued that such a project should supplant the job of analyzing knowledge"[3]. Indeed many would argue that there is no need for philosophical analysis remaining would be satisfied with the analysis of the meaning of the term 'know'. This restrictive conception of philosophical analysis is sustained by a dilemma. Either a theory of knowledge is a theory about the meaning of the word 'know' (and semantically related epistemic terms) or it is a theory about how people come to know what they do. The latter seems to be not a part of philosophy but rather it is a part of psychology.

Hence, "If a theory of knowledge is to be regarded as part of philosophy, then it is about the meaning of the word 'know'. Consequently, the theory of knowledge is reduced to a theory of semantics"[4]. Theory of knowledge is mainly concerned with explaining what conditions must be satisfied and how they are satisfied in order for a person to know something. When we specify these conditions and explain how they are satisfied, then we shall have a theory of knowledge. Analysis of knowledge would further mean the conditions of knowledge. Thus, some of the central problems faced by the epistemologists can be stated as: 'Which beliefs are justified and which beliefs are not? What is it that one can know? How knowing differs from true belief? Is there any relation between seeing and knowing?'

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[3] Cf., A. J. Ayer, ' *The Foundation of Empirical Knowledge*' Macmillan, London, P. 5.
[4] Cf., Keith Lehrer, *knowledge,* Clarendon Press, London, 1974, P. 5

Epistemology extends itself into three dimensions regarding the extent of human knowledge, about the various sources of knowledge, and about what knowledge itself is. There has been a disagreement among philosophers themselves where the extent of human knowledge is concerned. Therefore W.S. Sellars stated that "the task of coming to understand human knowledge is to develop a system of concepts that adequately captures the nature of our knowledge"[5]. The standard account of knowledge, around which all recent work has been done, defines knowledge as justified true belief.

Consider the following definition:

*A knows that **P** if and only if*

1. *P is true*
2. *A believe that **P**, and*
3. *A is justified in believing that **P**.*

This definition of knowledge was called the *tripartite* definition or the *tripartite account*, because there are three parts to this definition. This account of knowledge defines knowledge in terms of the conditions that are mentioned above. It has certain advantages. Firstly, the clause that **P** is true is normally taken as stipulative. The second clause talks of 'believing' seems to be minimal, and the third that if **A** knows that **P** then his belief that **P** is justified, is there, in order to prevent any lucky guess from counting as knowledge if the guesser is sufficiently confident in believing his own guess. It is worth to note, however, a

[5] Harold. I Brown, "Epistemic Concepts: A Naturalistic Approach", *Inquiry,* 34, PP. 323-51.

consequence of this justification of clause three; this is that a belief is not generally considered to be justified by the mere fact that it is true, for otherwise clause three would be unnecessary.

Though the above definition had its own advantages there were certain problems for the traditional definition of knowledge. This was pointed out by Edmund Gettier. This criticism was leveled against the traditional definition mainly with regard to clause **2**, is insufficient to believe that **P,** is not so strong as to be certain that **P,** and to know one must be certain not just believe. Certainty becomes an account in analysis of knowledge because people are rightly hesitant to claim knowledge when they are less certain. For Gettier, the conditions stated do not constitute sufficient conditions for the truth of proposition that **S** knows that **P.** For Gettier, it is possible for a person not to know even when all three clauses are satisfied. Gettier does not quarrel with regard to the three clauses, but simply states that though they are necessary, individually they require supplementing or require an amendment. This he explains with the analogy that a person is watching a Wimbledon championship and feels that a particular person, say **Mr. X** has won the championship. But in the actual sense, the cameras have ceased to function and the television is showing a recording of last year's match. But while it does so the person is in the process of repeating the last year's replay match. So the person's belief that **Mr.X** has won championship is true and surely he is justified in believing it. But we would hardly allow that he knows Mr. X won this year's championship.

The above was a counter example that Edmund Gettier provided against the traditional definition. But the question that arises is 'what do these examples rely upon?' Gettier poses two things and that is, it must be possible for a belief to still justify and a justified belief must justify any beliefs it implies (or is justifiably believed to imply). It becomes impossible to reject Gettier's examples as they are perfectly effective in their own terms.

There are certain responses to Gettier's arguments and all stem from different diagnosis of the way in which the tripartite analysis is lacking. The most obvious diagnosis is the presence of 'relevance falsehood' that nothing can be known which is inferred from false belief or from a group of beliefs of which one is false. Again this raises certain defects. Firstly, variants on the Gettier theme can be written in which though there is falsehood, there is no inference. The second defect is that the suggestion is too strong and is likely to make it impossible for any of us to know anything at all. As we suffer from numerous false beliefs that have some role in our inferential processes none of our present true justified beliefs would count as knowledge. To eliminate the two defects mentioned above one must remove the reference to inference and tighten up the relation specified between the false beliefs and the true justified ones which count as knowledge. Thus, we could simply require an absence of falsehood.

Another suggestion is 'defeasibility'; there can be no other truths other than the person's believing it; would have destroyed his justification for believing

something. We require for knowledge that the justification be indefeasible, that is, the addition of further truths should defeat it.

The third suggestion is "reliability". A justified true belief can be knowledge when it is derived by a reliable method. A reliable method means a suitable method, which if properly followed is perfectly reliable and never leads to false beliefs.

Another response to Gettier is provided by the Conditional Theory of knowledge of Robert Nozick. Nozick argues that the key to knowledge is tracking the truth one knows with the help of perception. For example, that 'there is a bird on the ledge', because one wouldn't believe this if it weren't. Nozick suggested, " the reason why we take the justified true belief in those examples not to have been known is that **A** would have believed them even if they had been false"[6].

Consider the same example that was used earlier, that is, of Wimbledon's championship. The reason why **Mr. X** believed that **Mr. Y** is this year's champion was too lucky or too luckily true to count as knowledge, is that his route to this lucky truth was such that even if it had been false, he would still have ended up believing it. Nozick takes it therefore that for **A** to know that **P** we, require that **A** would not have believed that **P,** if **P** had been false.

Thus one can obtain the preliminary account that **S** knows that **P** *iff*

1. **P** is true.

[6] Cf., Dancy Jonathan, *An Introduction to Contemporary Epistemology,* Blackwell Publishers, UK, 2000.

2. A believes that **P,**

   With

3. If **P** were not true, **A** would not believe that **P.**

4. If in changed circumstances, **P** were still true, **A** would still believe that **P.**

But the conditional theory seems to be less demanding than the causal theory as it takes causal theory as a special case. One might think that if the fact that '**P** does cause '**A**' belief that **P,** then the two subjunctive conditionals will be true and not vice versa. "The conditional theory is generalization of the causal theory, and it preserves the truth of the two subjunctive conditionals and it is also close to Dreske's version of the 'conclusive reasons' approach"[7].

This theory gives an account of what it is for belief to be luckily true. The extent to which **A**' s belief is luckily true is the extent to which even if it had been false, '**A**' would still have believed it, or if it were in changed circumstances still true, he would still not believe it.

Though the conditional theory is attractive in its own way, it provides a promising account of knowledge that escapes the Gettier type of objection, and it also destroys the skeptical move. This theory thus seems to have some link between certainty and knowledge. Someone who claims that he knows '**P**' is claiming that if '**P**' were not true, he would not believe it, and if '**P**' was true he would believe it. But this claim is precisely one which he would not make if he were not certain of that '**P**'. What the different school boy has lost is the

[7] Cf.....ibid

confidence that his beliefs are tracking the truth; although he does believe that **'P'**, it is at least probable that he is wrong as that he is right. The theory therefore, analyses the certainty required for a knowledge claim as the belief that the two subjunctive conditionals are satisfied. It uses this analysis to explain the otherwise puzzling fact the different school boy does know but cannot claim to know.

Nozick's account of knowledge succeeds in defusing one of the skeptical arguments. But there remains a complaint that Nozick would probably have made. He could say that his conception of knowledge is an 'externalist' conception, while one of the skeptical arguments from error is an internalist one. If externalism is a sound stance, then the argument from error is irrelevant; for it does no more than elaborate on defective (though traditional) approach to epistemology or if it does more, it succeeds only in showing how that defective approach must lead to skepticism. The meaning of term 'externalism' and 'internalism' is provided with example. The causal theory of knowledge, which defines **A** knows that **P** as equivalent to

1. **P** is true
2. **A** believes that **P**
3. **A's** belief **2** is justified
4. **A's** belief **2** is caused by the fact that **P** is true.

This is externalist conception as condition **4** is one which **A** might be entirely incapable of recognizing or pointing to when asked whether he does know that **P.** The externalist would say, as long as condition **4** does in fact hold whether **A** is able to point it or even to understand it or not, **A** does know that **P** (given condition 1 – 3). The internalist would claim that for the causal clause to turn justified true belief into knowledge, it must not only be true but be believed by **A** to be true. Thus, the internalist would add:

5. **A** believes **P.**

There are arguments in favour of externalism and arguments in favour of internalism. This externalist can point out how difficult it is going to be for the internalist to provide a satisfying account of knowledge. Surely, externalist might say, if we are to add clause **5** we should add

6. **A's** belief **5** is justified,

and then presumably

7. **A's** belief **5** is caused by the fact that **5** is true.

This surely generates an infinite regress, which will mean that internalism will be doomed to scepticism. What is more, the regress does not depend on the causal element of the example used. One could create the same regress by starting from the traditional tripartite conception and adding, on internalist grounds,

4 **A** believes **3**

And then presumably requiring,

5. **A's** belief **4** is justified

And then

6. **A** believes **5**

And so on.

The internalist can respond by pointing out how great our natural intuition is to favour the internalist conception. Suppose that we work with the causal example; it is required for knowledge that the fourth clause be true, but not that **A** have any inkling that the fourth clause be true. Doesn't this show that, for all **A** knows, he doesn't know that **P**? And how can he know that **P** when for all he knows he doesn't?

In Dancy Jonathan's opinion neither of these arguments is effective in destroying its opponent. The first merely point out the difficulties with scepticism; the internalist would accept this and say that these difficulties have to be faced and not ignored. The second seems to amount more to a statement of the internalist position than an independent argument against externalism. D. Jonathan doubt that there can be a conclusive argument in favour of either of these approaches; the approaches are so different that there is a danger that any argument will simply beg the question.

II JUSTIFICATION OF KNOWLEDGE

Another most influential position in epistemology centers on the justification of knowledge. There are different views. We first begin with a view called 'classical foundationalism'. This theory begins with as to what it means by

justification and what it is for a belief to be justified. The theory of classical foundationalism offers us a compelling picture of what the different aims of epistemology are, in other words, it amounts to clarify the definition of epistemological enterprise.

Classical foundationalism divides beliefs into two groups: one group of beliefs are those that need support from others and the others are those that can support others and need no support themselves. Epistemological foundations consist of those beliefs which can support others and need no support themselves. The superstructures are built on those beliefs that need support from others. Foundationalism identifies a structural difference between foundationalism and superstructure; that is between what is commonly called, basic and non-basic. For the classical foundationalist, one's basic beliefs are beliefs which 'concern the nature of our own sensory state that is our own immediate experience'. Such beliefs are independent and need no support from others; there are other beliefs that need support and hence must get it from our beliefs about our own sensory states.

Such theories of knowledge and justification have come to be known as 'foundation' theories because they fit the metaphor of knowledge as an edifice supported by a foundation of beliefs. Classical foundationalism expresses the central tenet of empiricism, the view that all our knowledge is derived from our experience. And a belief which is not about our own sensory states must be justified by appeal to beliefs which are about our own sensory states. Why does

it seems to be so? The reason is our beliefs about our present sensory states are infallible. Due to this, such beliefs can play the role ascribed to them in this form of empiricism. Beliefs about our present sensory states can be our basis and can stand on their own feet and support the rest, because they are infallible. Empiricists disagree among themselves about the object of sense-experience. There may be difference of opinion with regard to item sensed, as some may conceive it as a physical thing like chair, meter or a subjective entity like an appearance or a sense-datum. The disagreement might even extend with the way statements, are self-justified and also how basic beliefs justify other statement. But they agree that there are observation statements. The observation statements make up the content of basic beliefs which justify all that is justified and refute all that is refuted.

From this we can trace the aim of epistemology from the point of view of classical foundationalist. It is a kind of research program that sets out to show how it is that our beliefs about an external world, about science, about a past and a future, about other minds, etc, can be justified on the basis of infallible beliefs about sensory states.

The classical foundationalists support their views by taking arguments from probability and certainty, and the regress argument.

The probability argument suggests that a proposition with probability **1**, is certain. But certainty and infallibility are not identical, and we are trying to explain a theory which takes its basic beliefs to be infallible. However the move

from one to the other is easy. If a proposition being certain has a probability of **1**, then there is no chance that a belief in that proposition will be false. So the belief will be infallible. There is an oddity in the argument that starts by insisting that we speak only of probability relative to evidence, and ends by talking of a proposition having a probability of **1** in its own right. Probability theorists escape this oddity by defining 'absolute probability' in terms of 'relative probability': it is said that the absolute probability of hypothesis is equal to the probability of hypotheses (h) relative to tautology. But whether this man-oeuvre is more than a technical devise is dubious.

The regress argument is an argument that states that besides inferentially justified beliefs, there are some beliefs that are justified non-inferentially. Inference is basically a matter where we move from the premises to the conclusion along an acceptable path. If the premises are unjustified, there will be no justification for the conclusion, at least not by this inference. One has to suppose that only justified beliefs can justify others; and it is this thought which generates regress. If one takes it that all justification is inferential and when we justify belief **A** by appeal to beliefs **B** and **C**, we have not yet shown **A** to be justified. We have only shown that it is justified if **B** and **C** are. Justification by inference is conditional justification only; **A**'s justification is conditional upon the justification of **B** and **C**. If all justification is conditional in this sense, then nothing can be shown to be actually, non-conditionally justified. For each belief whose justification one attempts, there will always be a further belief upon whose

justification that of the first depends and since this regress is infinite no belief will be more than conditionally justified.

The regress argument therefore drives us to suppose that there must be some justification which is non-inferential. The regress argument proceeds by *reductio ad absurdum*, starts by assuming the negation of the conclusion, that is, that all justification is inferential. Inference is a matter of moving along a path from premises to conclusion. Conclusion can only be justified if they follow from justified premises.

There are certain objections leveled against the classical foundationalist. The main objection to classical foundationalist is that there are no infallible beliefs which are raised by the fallibilist. In reply to the critic, the infallibilist tends to reply that there is room for a mistake in the description of one's sensory state. For instance, a person may describe his sensory state as being an experience of pink, when, in fact, it is an experience of orange. This is claimed by the infallibillist as 'merely verbal error'. Mistake can be only with regard to the meaning of the words of that person and not with the present sensory states. The description may be false, as describer the person is infallible. Infallibilist, also states that, such verbal errors can be corrected by means of standard ways. The person can be reminded of the differences between pink and orange, by presenting a color chart. By then, the individual may grasp the difference and may apply it to the present experience, and see whether the experience is one of pink or of orange. The infallible beliefs are intended within the programme of classical

foundationalism. Infallible beliefs are intended to act as those by appeal to which all is to be justified. They are the basic beliefs which ground all others, our epistemological foundations.

Infallibilist error can be looked at by considering briefly the arguments of Roderick M. Chisholm, a leading contemporary foundationalist. Chisholm "distinguishes between 'comparative' and 'non-comparative' use of the phrase 'appears white'"[8]. In the comparative use, 'x appears white' is short statement for x appears the way in which white things normally appear'. In the non-comparative use which is found in the sentence 'white things normally appear white', things are different. Such sentence would be tautologous if expanded 'appear white' in it as for the comparative use. It is not tautologous hence there must be another non-comparative use of the phrase 'appear white'- a use in which we make a genuine attempt to describe, without comparison, the way in which white things generally appear. Chisholm claims that in non-comparative use, appear statements express what is 'directly evident'. A directly evident proposition for Chisholm is either identical with or entailed by a true contingent proposition, which is all but certain. A belief in a directly evident proposition is not the same as infallible beliefs, but shares the characteristics that all of them are true. Chisholm followed the traditional line that all apparent errors in beliefs about our sensory states is verbal error, and that verbal error is to be mistaken for substantial error.

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[8] R.M. Chisolm, *Theory of Knowledge,* 2nd ed, Englewood Cliffs, Prentice Hall, NJ, 1977, PP. 30-33.

In the absence of infallibility, the program of classical foundationalism collapses. This is not the only or necessarily the best form of foundationalism, one could inquire whether there could be a weaker version of Foundationalism. The first characteristic foundationalist thesis embodies the response to the regress argument. A belief is incorrigible if and only if no one could ever be in a position to correct it. A belief is indubitable if and only if no one could ever have a reason to doubt it.

One tradition in philosophy holds the view that we already have knowledge as we possess 'innate ideas'. These were the views of Descartes. Descartes, the rationalist never questioned as to how things seemed to him at that time, instead he tried to show how he could know other things, for instance the existence of God, or the material world. John Locke on the other hand set a classical pattern whereby he held that, a person is directly aware only of the nature of his or her own sensory idea and that everything else is known indirectly to him.

From the above we see the Cartesian suggestion that epistemology was concerned with the 'individual'. There is no interest in stressing the growth of knowledge through generations. Each of us is thought of as starting more or less from scratch and the philosophical questions are how we can come from such a state, via our awareness of passing of sensory experience to the sophisticated knowledge which we all have as members of modern society. This approach was rejected as it could not give a complete explanation to the above views thereby

leading to skepticism. Skepticism is related especially when it comes to knowledge of sensory states other than ourselves. It acknowledges the danger that we might be unable to construct the superstructure that foundationalists are supporting.

Let us consider at this stage the 'problem of other minds'. How do we know others have sensory states similar to our own?

Scepticism regarding existence of other minds is reflected in the traditional argument from error. For instance, we observe that some individual conceal their states of mind or pretend something different from what they really are.

This argument is weak, as it assumes that there are other minds other than our own. We may be mistaken about their states, thinking someone to be happy as when the person is sad, but this does not nullify existence of other minds.

Consider, the *argument from analogy.* This argument is found in the writings of J.S. Mill who admits that it is possible that the objects we call person other than ourselves are mindless automata, but claims that we none the less have sufficient reason for supposing this not to be the case. J.S.Mill gives the following argument for existence of other minds. According to Mill, "just a person is aware of series of facts, sequence of events, modification of his own body feeling, etc., there are also the similar series of events in the others. Just as one individual is aware that the first link produces the last through the intermediate link, and could not produce without it. It is experience that obliges

me to conclude about the intermediate link which must be the same in others as well as in myself"[9].

This argument is criticized as an inductive argument and is treated as a very weak argument. The difficulties for the argument are obtained from two assumptions: assumption of separability and assumption about understanding. Scepticism and the skeptical argument suggest that one cannot make sense of the idea of a subject of experience other than yourself. One cannot conceive of experience which are not one's for instance generalizing the simple example of pain. One cannot achieve in another way a conception of a subject those experiences which are not one own. This drives one away from foundationalism to more interesting form of "solipsism', the view that you must take yourself to be the only subject of experience. Since you have no conception of the other.

Thus, the conclusion from all this is not that skepticism, indeed solipsism is inevitable, but that the terms in which the skeptical argument was presented, must be rejected. In rejecting that assumption we render the argument from analogy as redundant. What is then the way to find a conception of mental states from others?

One such conception is 'behaviorism' that provides a conceptual link between behavior and mental states by saying that the mental state of my being in

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[9] J.S.Mill, *An Examination of Sir William Hamilton's Philosophy,* Longman's : London, 3rd Eds. Quoted in Dancy Jonathan, *"An Introduction to Contemporary Epistemology", Blackwell Publishers, UK.*

pain in my knees is just the behavioral state of my wincing and holding my knee taking greater care of it, etc.

There are certain difficulties with the behaviorist account of mental states. Though in a way they do provide what is required, that is, an account of mental states in which they are non-contingently related to behavior, they ignore everything that is characteristically mental. For instance, in case of pain, behaviorism ignores the way each one feels pain.

Epistemology is intimately connected with the theory of meaning. The theories that are put forth as a response to skeptics are also theories of meaning. However, it is difficult to understand propositions whose meaning is such that they express (or purport to express) evident transcendent facts(anti realism).

This arose due to Wittgenstein's criticism on foundationalism that the 'solipsist' cannot develop a language. This criticism of Wittgenstein depends on a view about what competence with a concept is. It is a view about what it is to know the meaning of a word, and the rules for application of that word. According to Wittgenstein a solipsist cannot develop rules the way it is required and therefore cannot construct a language.

A major shortcoming of classical Foundationalism is its inability to provide a sufficient theory of meaning. Though foundationalism has its own short comings, it has another characteristic stand, that of empiricism. It can be seen as the expression of the empiricist thought that it is verification and justification that tells us whether something is true and also whether the evidence is backed by

one's senses. From this, it is the evidence of our senses that one starts from when we need to construct a justification for our beliefs. And it is also the starting point in learning a language. So this notion of the evidence of one's senses is held by empiricists to be basic in epistemology as well as in the theory of meaning. This discussion is evident among positivists such as A. J. Ayer who proposed a theory of meaning that was called the 'verification principle of empirical significance'.

According to Ayer (1946) "a statement has empirical meaning if its truth would make a difference to the evidence of our sense"[10]. Accordingly, a statement is verifiable if and only if its truth would make a difference to the evidence of our senses. This is equivalent to "verification principle 1: a statement has empirical meaning if and only if it is verifiable"[11].

This account amounts to what it is for someone to understand a statement or to know its meaning: UP (Understanding Principle) "A knows the meaning of P if and only if Q knows how to verify P"[12]. All the three principles above are accepted by the empiricists. Verification Principle 1 is the core position of logical empiricism or logical positivism. To know 'what is meant by verify?' a distinction is traditionally drawn between strong and weak verification. Strong verification, means conclusive verification, that is, a statement is conclusively verifiable if one has the best possible evidence for it; there remains no possibility that the statement be false. Weak verifiability is less conclusive. A statement is

[10] Cf., A.J.Ayer, *Language, Truth and Logic,* Dover's Publications, UK , 1952,
[11] Dancy Jonathan, "*An Introduction to Contemporary Epistemology*", Blackwell Publishers, UK, P. 87
[12] Ibid.... 87

not itself strongly verifiable, it is confirmable or disconfirmable by appeal to other statements which are conclusively verifiable.

Thus 'verifiable' in verification principle 1 implies strong verifiability. On this basis, one can see a close relation between logical empiricists and foundationalists. Foundationalists claim that there are two types of justification namely the inferential and non-inferential. A similarity can be noted in the logical empiricism that all significant statements are either strongly or weakly verifiable. But which statements are conclusively verifiable, which statements report the evidence of one's sense? Logical positivists differ on this question just like the foundationalist differ on the nature of basic beliefs. For Ayer, "observation statements are those which describe the nature of present sensory states"[13]. On the other hand, for Quine, an observation statement is one that is made in response to certain stimuli and strongly verifiable by appeal to the occurrence of stimuli. So, the notion of 'observation statement' that reports evidence of one's sense, is in dispute among logical empiricists. That which is not disputed, is the distinction between strong verification and its relevance to the theory of meaning. As for the relation between the observation statements and others, the latter are made confirmable or disconfirmable by appeal to the observation statements. To the question regarding the relationship between observation statement and the others, there seem to be three answers, namely: Phenomenalism, Carnap's relaxation and Quine.

[13] Ibid.... P. 88.

Phenomenalism, as a meaning theory of non-observation statements, holds that "such statements are equivalent in meaning to a (probably very long) lists of statements about what would be observed under different circumstances, all linked by conjunction"[14].

Taking Quine in particular there are three distinct inputs to Quine's eventual position here. Firstly Quine's thesis that theory is underdetermined by data (evidence). No matter how much evidence one may have there will always be different theories that explain and assimilate the data equally well. No theory is ever entailed by the data. Different theories can have the same observational consequences. As far as non-observation sentences are concerned Quine believes *a la* Duhem who suggests that individual non-observation sentences cannot be conclusively verified or conclusively falsified by observation or by the evidence of our senses. These types of sentences do not occur alone, but always as part of the general theory. They are never confirmed by experience. Experience can confirm theories, and thereby confirm the sentences of which the theories are constructed, but cannot confirm those sentences singly or directly. No matter how well experience goes, it is only able to confirm a non-observation sentence in the light of the theory that surrounds it. If the theory is altered then non-observation sentence might not be confirmed by experience at all.

The third input is the empiricist theory of meaning. The non observational statement does not have meaning, since meaning is a matter of observational

[14] Dancy, Jonathan, A*n Introduction to Contemporary Epistemology,* Blackwell Publishers, United Kingdom, 2000, P. 89.

consequences that belong to theories. Quine is of the view that meaning belongs to theories rather than to sentences. Quine holds, that (unlike Carnap), "a non-observation sentence does not have its own observational consequences"[15]. So at the non-observational level, sentential meaning is indeterminate. There are no facts that will determine what individual sentences mean. Quine calls this thesis the "indeterminacy of sentential meaning". So Quine's theory of meaning as far as non-observational sentences are concerned can be called "holistic". As opposed to holism there is atomism that states, that each sentence has its own meaning, which it carries about with it from theory to theory. Holistic view holds that the "meanings of sentences are interdependent, so that what one mean depends upon the meaning of others, and can be changed by a change elsewhere. Meaning is something born primarily not by the parts but by the whole theory, since the whole theory is the only thing that has its own observational consequences. Nothing other than the whole theory is conclusively falsified by untoward experience"[16].

For Quine, when most sentences are made true, they are so made on the basis of what they mean in the real world and how the world is. Traditionally these statements were called synthetic statements. Apart from this there are also the statements that are true solely because of what they mean, which were called analytic truths and they were recognized as true by someone who knew nothing

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[15], ibid... (Quine(1953), Two dogmas of empiricism), P. 94

[16] Cf., Dancy, Jonathan, *An Introduction to Contemporary Philosophy*, Blackwell Publishers, UK, 2000, P. 94.

other than their meaning. Such statements were unrevisable, there was no possibility that they could become false, unless their meaning changed. Quine's position was that there are no such analytic sentences. The sense in which one talks of the meaning of an individual sentence is not determinate enough to make it possible that a sentence be unrevisably true by virtue of that meaning.

So Quine argues that the empiricist theory of meaning, together with Duhem's thesis and the under-determination theory by data, has the effect of collapsing the notion of sentential meaning which it was supposed to explain.

Foundationalism offers a structure in its assertion that the direction of justification is all one way and in its claim it states that there are some comparatively fixed points in its structure, the 'basic beliefs'. The notion of inference from fixed points clearly embodies the relevant asymmetries. The notion of inference itself shows that it is asymmetrical. It is possible to infer **B** from **A** without being able to infer **A** from **B**.

The coherence theory seems to be completely holistic theory and is intended to be symmetrical. To understand this, we have to understand what coherentist means by 'coherent'. Coherentist argues upon 'consistency' as a necessary condition for coherence.

F.H. Bradley(1914) states that "a coherent set should be complete or comprehensive in some sense"[17]. The word consistency and completeness were not enough, as they did not capture the feeling that coherent set stuck together or

[17] F.H. Bradley, '*Essays on Truth and Reality*' ,Oxford University Press, Oxford, 1914, P. 110

fitted together in a special way. To capture this, classical coherentist used the notion of 'entailment' that is '**P** entails **Q**' if and only if 'given **P**', '**Q** must be true'. Brand Blandshard wrote, "In a fully coherent system no proposition would be arbitrary, every proposition would be entailed by the other jointly and even singly, no proposition would stand outside the system"[18].

This account of coherence in terms of mutual entailment is disputed. E.C. Ewing suggested that "it would be sufficient that each member of a coherent set be entailed by all the rest and that anything further than this would be disastrous"[19]. The notion that Blanshard uses is symmetrical enough as entailment traditionally understood isn't a matter of degree. This is important because the coherentist want to give a sense to the notion that as one's belief set grows; it improves hopefully and becomes more coherent.

If we are to have a coherence theory of justification, we need to provide a good sense to the idea as to how justification can grow. This alternative account of coherence, is offered in Keith Lehrer(1974) and Roy Wood Sellars(1973), that defines a coherent set as one that is consistent, complete and mutually explanatory. As the set increases in size, we can hope that each member of it is better explained by the rest. Explanation can improve in quality and this accounts for the growth of justification. The notion of mutual explanation is clearly symmetrical in the required sense.

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[18] Roderick Firth, 'Coherence, Certainty and Epistemic Priority', *The Journal of Philosophy,* Vol. 61, No.19, American Philosophical Association Eastern Division, Oct.15, 1964, PP. 545-557.

[19] (A.C Ewing, (1943) *Idealism: A Critical Survey*(London: Meuthen), Quoted in Dancy, Jonathan, *An Introduction to Contemporary Epistemology,* Blackwell Publishers, UK , 2000, P. 111

The coherence theory of justification and the coherence theory of truth are closely connected. Before discussing the coherence theory of justification, the coherence theory of truth needs to be considered. This theory holds that a proposition is true if and only if it is a member of a coherent system. If there is doubt about the possibility of the fully coherent set, then truth is understood in terms of matter of degree. That is propositions are true to the extent that there is a coherent set of which they are members. But on analysing this theory if truth is not identified with coherence, it gives no sense to the notion of a true set. Instead it defines truth for members of sets. A proposition is true if and only if it is a member of a coherent set. Propositions cannot be coherent in the required sense, and sets cannot be called true unless they are members of the larger sets.

The coherence theory only provides a criterial account of truth. At the same time it also offers a 'definitional account' of truth. Many philosophers have shown interest towards this theory but others especially Bertrand Russell (1907) have disputed the view that the theory offers a definition of truth which, if taken away the theory would manifestly become false. It is manifestly false because no matter how tight our account of coherence, we shall have to admit that there may be more than one coherent set of propositions. Nothing in the notion of coherence as defined, gives us any right to say that there is a unique most coherent set. It is obviously the case that there can be at most one complete set of truths. So truth cannot be defined in terms of coherence alone. This objection to the coherence

theory of truth is a standard one and is called plurality objection. Coherentists find the plurality objection unacceptable.

As Brand Blanshard states: "this objection, like so many other annihilating criticisms, would have more point if anyone had ever held the theory it demolishes. But if intended to represent the coherence theory as responsibly advocated, it is a gross misunderstanding"[20].

The coherence theory of justification holds that a belief is justified to the extent to which the belief set of which it is a member is coherent. Belief is evaluated by appeal to the role it plays in the belief set. What then is the link between the justification and truth? Donald Davidson thinks, "if Coherence is a test of truth, there is a direct connection with epistemology, for we have reason to believe many of our beliefs coherent with many others, and in that case we have reason to believe many of our beliefs are true. When the beliefs are true, then the primary conditions for knowledge would seem to be satisfied"[21].

What brings truth and knowledge together is meaning. If meanings are given by objective truth conditions there is a question regarding how we can know if the conditions are satisfied? For this would appear to require a confrontation between what we believe and reality; and the idea of such a confrontation is absurd. If coherence is a test of truth, then coherence is a test for

[20] Brand Blanshard, T*he Nature of Thought,* Allen and Unwin, London, 1939, P. 114
[21] Ernest Sosa and Jaegwon Kim (ed), *Epistemology: An Anthology*, Blackwell Publication, 2000, P. 154.

judging that objective truth conditions are satisfied, and we no longer need to explain meaning on the basis of possible confrontation.

A belief set with reasonable coherence will make each of its members justified. It does not mean that they are all true. Coherentists stress a point that truth and justification are all of a piece. The coherence of a belief set goes to make its members justified; the coherence of a set of propositions, believed or not, goes to make its members true. Keith Lehrer (1974), too suggested that what needs to be explained is not the truth of ***P*** but rather the fact that A believes that ***P***. So in this respect, theory of truth fits the theory of justification.

N. Rescher suggested an advantage of Coherentism "is that it directs attention away from the individual's struggle to construct his own epistemology, which is the classical conception of the epistemological enterprise.; instead it gives a sense to the notion of knowledge as a social phenomenon, something that can be shared and which can increase by means of that sharing".[22] Coherentists begin with traditional egocentric problem of what each one of us is justified in believing. Because of this, they don't diverge from the traditional views, except in insisting that the initial data are restricted to basic facts about one's sensory states. Coherentists suppose that their theory not only provides a possible justification of induction, but also offers a general stance from which the skeptic views can be defused, if not rebutted.

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[22] Cf., N.Rescher, *The Coherence Theory of Truth'*, Clarendon Press, Oxford, 1977.

Apart from this, Coherentist theory also claims that holistic theory fits into the actual practice better than foundationalist accounts. Observational beliefs are supported by appeal to theoretical ones. So there is no theoretical need to accept the asymmetries. Coherentists makes a virtue of necessity, absence of fixed points and lack of any clues about where revision should start. One knows that at any time one's belief set is merely provisional. Revisions are called for anytime and the need to revise may occur anywhere. This is a form of fallibilism that is welcomed by the coherentists and claimed that approach reveals the strength of fallibilism. Fallibilism is not an unfortunate defect but an essential part of epistemological enterprise and greater coherence is achieved only by means of revision. Further fallibilism defuses the views of skeptics rather than rebutting them.

Given the above characterizations of knowledge, there are many ways that one might come to know something. Knowledge of empirical facts about the physical world involves perception, in other words the use of the senses. Apart from this, all knowledge requires some amount of reasoning. Memory too allows one to know something that we knew in the past, if we no longer remember the original justification. Apart from the above discussion, epistemologists are also concerned with the extent of human knowledge that is, 'how much do we, or can we know?' Whatever turns out to be the correct account of the nature of knowledge, there remains the matter whether we actually have any knowledge, and it has been suggested that we do not or cannot know anything, or that we do

not know as much as we think we do. Such a view is called skepticism. One can distinguish between a number of different varieties of skepticism. Skepticism in general maintains that certain knowledge is impossible. Skepticism, depends on argument - stronger the argument stronger the skepticism generated. The conclusion that is normally generated by a skeptic is that "Knowledge is impossible. No one does know because no one can know"[23].

There are two types of skepticism namely local skepticism and global skepticism. Local skepticism maintains that even if knowledge is possible anywhere, it is for special reasons not available in certain selected areas. Special cases are areas of ethics, religion and future. According to this type, it is possible to know about objects in front of us but it may not be possible to know that an altruistic act is morally good, 'God exists' etc. It is difficult to keep local skepticism local as it spreads and tends to become 'general skepticism' about the unobserved or about the possibility of scientific knowledge. 'Global skepticism' however is more convincing and effective than their local counterparts. Global skepticism attacks the notion of knowledge directly but leave the other notions crucially 'justified beliefs', as untouched. A skeptic would argue as "to know one must be certain, but that one can never be really certain and hence one can never know"[24]. Skepticism is supported by three arguments. They are Brain in

[23] Cf, Dancy, Jonathan, *an Introduction to contemporary epistemology*, Blackwell Publishers, Uk.2000.
[24] Cf.,...ibid.

vats (the older was the 'evil demon scenario- Cartesian skepticism'), the argument from error, and the justification of arguments from experience.

The *first* argument (brain in vats) uses the principles of closure to show that you don't know anything of which you know that if it were true you would not be a brain in vat. The principle of closure asserts that 'if A knows that **P**, and that implies **Q'**, **A** also knows that **Q**; we always know to be true any propositions we know to be the consequences of a proposition we know. The principle, then, given that **A** does not know that **Q** and that **A** does know that **P** implies **Q**, allows one to infer that **A** does not know that **P'**. It seems therefore to show, more generally, that since you don't know that you are not a brain in a vat you cannot know any proposition **P** of which you know that if **P** were true, you would not be a brain in a vat. This is not entirely global; it admits that knowledge is possible. For example, that you can know that **P** implies **Q,** and indeed uses this fact as a lever. Its grip is restricted entirely to those propositions whose truth would mean that you were not a brain in a vat. It is however a strong argument in the sense it aims to attack the notion of knowledge. This can be shown by running a complete analogue of the argument. All one needs is to show that your belief that you are not a brain in vat cannot be justified since nothing in your experience can count as evidence for that proposition and then appeal to an analogue of principle of closure, which holds that if **A** is justified in believing that **P**, and that **P** implies **Q**, **A** is justified in believing that **Q.** This argument seems to do nothing to understand the proposition. You are still allowed to understand it even if you can

neither know it nor be justified in believing it. The argument turns into an argument about understanding if we take a special view about understanding.

The *second* states that the mistakes that an individual would have made and further assumes that we would also make them in imaginarily similar circumstances we do not know now. There is no separable area wherein we make no mistakes. Therefore the argument from error turns out to be global rather than local. The second argument attacks the notion of 'justified beliefs' as it proves to be global rather than local.

The *third* argument from experience, argues by taking into consideration 'experience' which we take as a reliable guide to the nature of those parts of the world which we are not observing and that in favorable cases it gives us knowledge. This argument was raised by David Hume (1711-76) in a special way. He argued with help of analogies. Hume's point was that it is impossible to have any reason for that last belief. For that belief is neither analytically nor necessarily true, no contradictions implied by supposing it false.

Experience cannot give reason to believe that the unobserved will resemble the observed, as the appeal to experience begs the question asked. It argues not to, but from the crucial belief that our experience is a reliable guide, or that the unobserved will resemble the observed. Thus there are no reasons to believe that one's experience is a reliable guide, and hence we can have no reason for any belief about events beyond our experience and so cannot have knowledge of them.

These are the arguments that favor skepticism but they do have certain difficulties. First of all these arguments are not of the strongest types and that it is impossible to conceive of an event as other than present that is as being in the past or in the future. These arguments thus do not become global arguments. A skeptic implicitly claims to know only his conclusion that knowledge is impossible or that he claims that his premise justify his belief that 'justified belief is impossible'. Though these seem to be unconvincing it is rather effective. There is no point in arguing that justified belief is impossible, for if one was right, there could be no reasons for one's conclusion.

The discussions in the present chapter are introductory in nature and an attempt to lay bare what is commonly understood as 'knowledge claims' in philosophical discussions. The 'knowledge claims' in the history of philosophy have finally come to be dependent on contemporary philosophical positions, dominated particularly by analytic schools. It is in response to these dominant traditions, which very often are referred to as 'traditional' epistemologies that Jean Piaget's 'genetic epistemology' would be juxtaposed. In the immediately following chapter, however an attempt would be made to broaden the debate to include contemporary epistemology's three main concerns, namely, language, truth and reality.

CHAPTER II

LANGUAGE, THOUGHT AND REALITY

Language is a necessary condition for philosophical thought. It is impossible to think, to believe, to act or to be conscious without a language. Hegel wrote in his preface to his *Science of Logic*: "It is in human language that the forms of thought are manifested and laid sown in the instance"[25].

Language is something which is spoken; it is an instrument by means of which something is said, with its uses as to make propositions, ask questions, issue orders, describe, name, express emotions etc. This makes language different from sounds that are made by other species for instance the parrot. Consider for example: if somebody says that he or she promises to complete the task tomorrow, it means that the person knows what he means by the word "promise", whereas in the case of the parrot it would be just the sound (in which case the parrot is performing the phonetic act). This phonetic act of the parrot may be explained as stimulus-response process. It would be inadequate or

[25] Hartnack Justus, *Language and Philosophy*, The Hague Press, Mouton, 1972. P.10

inappropriate to regard or explain a person's utterance of a sentence as a stimulus response process.

A person who speaks something performs what is called in Austin's sense an "Illocutionary Act". The parrot for instance does not perform any illocutionary act but on the other hand is performing only the phonetic act. Some instances of illocutionary acts are to make a promise, to ask a question, to issue a command, to make a report, to give a description, to name, to identify, to warn, etc. Thus language becomes an instrument which may be used to perform illocutionary acts. Language always speaks of the language user. The condition for a language user is to be able to perform an illocutionary act. Micheal Dummett stated that "language is the expression of what the speakers want to express, that is, their thoughts and experiences. It is commonplace to hold that language is a medium of communication and also a vehicle of thought"[26].

Not only is language the condition for the philosophical thought, but it is also a necessary condition for thought. In Noam Chomsky's words, "possession of human language is associated with a specific type of mental organization"[27]. The earliest roots of language are traceable to the use of natural signs within primitive patterns of communication. How does language arise? Does it arise from

[26] Cf., Micheal Dummett, *The Seas of Language,* Clarendon Press, Oxford, 1993, Chapter 7.
[27] Noam,Chomsky, *Language and Mind,* Harcourt Brace Javanovich, New York, P. 70.

communication? Is language the evolutionary product of relatively primitive patterns of animal communication? There seem to be different answers and suggestions put forth by different thinkers.

Language and evolution are the two terms that are of great importance. If language plays a key role in the emergence of human thought and understanding, then evolution theory provides the scientific explanation of the emergence and development of human life. Though they are important they are often misunderstood and the relation between them has not been fully clarified. There is no systematic theory of language, and for the psychological side of human evolution, the subject still largely depends upon Darwin's contribution, in spite of its criticisms.

To relate language theory and evolution, one has to seek the area where they meet. In evolutionary terms, this is called "adaptation" (a term that covers all that mediates between life and the world around it). Learning of all sorts and all higher forms of knowledge is the result of behavior which is sign mediated. This is dependent on signs and signals that enable animals not only to communicate and receive information from one another, but also to acquire information from their environment. It is this complex pre-existent and inter-related factors such as perception, behavior, signs, signals, learning ability, communication that sets the

stage for language. Even before language originates, one has to realize that it is a complex, emergent phenomenon, the nature of which can be understood only within the evolutionary context.

In every sense, language is a synthetic phenomenon, unlike any pre-existent forms of perception, behavior or communication out of which it is compounded. This is confirmed by the fact that language is clearly a late arrival on the evolutionary stage serving no immediate vital need. That its function is not directly causal but symbolically mediated. It is dependent not only on a physical stimulus as such, but also on some stimulus that is interpreted as significant of something else. Each of the organs involved in the production and interpretation of language has a biological function which is prior to and independent of its function in the buildup of language.

The recent attempt to make language as readymade endowment rather than the end product of complex learning process is to ignore both of the complexity of language and the nature of evolutionary processes. Most of the language theories fail to grasp that language is neither genetically determined nor empirically given. It is neither a readymade system to be passively acquired nor a form of behavior to be simply mimicked. It is something that is to be built up out of perception, behavior and experience of each individual, with whatever he or she receives from

the other members of the same speech community. It is only in such a process that verbal forms of any language acquire meaning. The forms that differ from one language to another have no intrinsic meaning. They are devices established by use and convention which in addition to their utility for communication, are the means by which each individual learns well or ill to monitor, reflect on or understand his own experience.

Therefore, if we are to explain the origin and nature of language we must turn not to genetics or neurology, which are the preserves of few, but to much more familiar areas of experience. Before approaching the language problem, it becomes necessary to throw light on evolutionary theory. "Evolution" is an area that covers not only the fossil record of reptiles but also their survival and extinctions. The evolutionary theory went through a rough time in the 19th century that also continued in the 20th century. Opposition to the evolutionary theories was stronger in the philosophical circles. Wittgenstein for instance, affirmed that the Darwinian Theory has nothing to do with philosophy and called evolution as "hypothesis of natural science". The influence of Wittgenstein was carried further. Even Karl Popper, philosopher of science, stated that he did not regard highly the explanatory power of the theory of evolution, which he described as a metaphysical research programme. Others emphasized all the higher mental

faculties and attributed them to some area of the brain; or more modishly, to the genes. David H. Lorenz for instance, assumed that "language learning is based on a phylogenetic programme which ensures that the child's innate power of abstract thought is integrated with the vocabulary that belongs to the cultural tradition"[28].

All these speculations were anti-evolutionary in character. The emergence of higher faculties and complex behavior cannot be explained in the above way. Evolution, at all times is concerned with the higher forms of life interacting with their environment. Environmental factors are as important as the purely psychological ones. One complex and uniquely human kind of mediation is language, which is not only a means of social communication, but also a vehicle of thought, as well as the instrument of analysis. Culture, is thus transmitted from one generation to another not by genes, but with language and derivative symbolisms. Thus, all human culture and thought pre-suppose the existence of human language. All the functions of language are rooted in human speech, it emerges out of prior forms of behavior and perceptions and it develops to become an indispensable constituent factor in human consciousness and rationality. If

[28] T.P Waldron, *Principles of Language and Mind: An Evolutionary Theory of Meaning*, Routeledge and kegan Paul, London, 1985,P. 19.

anyone tries to exclude man from the evolutionary scheme then it betrays lack of understanding of the most basic principle of evolution, namely that everything in evolution is a special case.

The truth is 'the theory of evolution' is a well established theory. But many of the contemporary thinkers consider it is as inadequate not only because its principles and mechanisms have not been clarified but because in this incomplete state the existing principle and mechanisms are made to do service where they clearly do not apply.

Contrary to the popular view is the modern theory of evolution that focuses on 'genetics' which dates back to the 1960s. The most important aspect that needs to be appreciated about this theory is the basis that it adopts to understand all forms of life including our own. This theory becomes an education in itself as, it accounts for all that is peculiar to life, and not just its physical basis but also genetic origins. This can also be seen in Darwin's work 'Origin of Species' with two other notable studies, "one dealing with human evolution, the other with those forms of animal and human behavior that culminates in the emergence of language"[29].

[29] Cf.,.... ibid

The main deficiency of contemporary evolutionary theory is its failure to account for the two most dramatic evolutionary shifts, the emergence of animate intelligence and of human rationality. But it had an advantage in the sense that it helped to solve both the above problems at the same time, as rationality could be explained only in terms of language theory, and the origins and functions can be explained only in terms of more general principles of animal intelligence.

Again, 'evolutionary theory' is often regarded as a myth. It was believed that evolutionary thinking was the invention of Darwin or his immediate predecessors, which was implicit in totemism and primitive mythology. It was influenced by Greek naturalism and all other such schools of thought. Another error is the belief that evolution theory is descriptive and incomplete. This reveals total incomprehension of the nature of theory.

Evolutionary explanation must explain novel and extremely complex development in terms of a mix of factors that are heterogeneous and incommensurable that no other person dares approach. Such explanation is achieved by showing that each of these factors is a necessary pre-condition for the emergence of some given development. The emergence of human language, consciousness, mind and reason must be explained in a similar way.

Another important point in evolutionary theory is 'behaviour'; along with perception it brings us to a distinctive kind of adaptation, which concerns psychological forms of mediation between living creatures and their world. With behavioral feedback and perceptual information we may call it knowledge. Knowledge is the chief evolutionary advantage of all higher forms of life. Therefore, there is a need to provide a theory of human knowledge that will clarify its origin in simple forms of semantic behavior and sign perception that combines and produce language, and clarify also how language first creates the possibility of conceptual thought. There is no discussion of the evolutionary theory in epistemology. Epistemology is usually relegated to metaphysics, a discipline whose subject matter has never been satisfactorily defined and abandoned by theorists who are either ignorant of the evolutionary principle or resolutely opposed to it. A remedy to all this is a need for rational epistemology based on evolutionary principles. This rational epistemology will account for behavior and perception as the primary sources of learning and knowledge. There is also the need for evolutionary theory of language, the locus of all these – behavior, perception, learning and knowledge that can lay the foundations of human intelligence and rational thoughts.

There have been different discussions provided to the question as to how language originates and the relation between communication and language.

Origins of language are intelligible only in terms of certain prior and well established facts of morphology and neotony that are distinctively human. There are certain complex interrelated factors, without which neither language nor the human species would exist. Language theorists feel that language might have originated independently of speech, for instance in gesture. Such theorists fail to acknowledge the complex symbolic nature and function of language that emerge with the help of vocal signaling and speech. Sometimes, the origin of language is traced to the brain or to the genes; this seems to be quite unproblematic matter of anatomy and behavior. Language could not have originated before the development of the human mouth as organ and one can be sure here that it emerged at more or less the same time. The mouth provides the indispensable mechanisms of speech. The other behavioral and perceptual pre-requisites for the origin of language are equally unproblematic, that is easily located among more general forms of behavior and perception, both animal and human. All behavior, knowledge and higher mental faculties of thought and reason are built upon and always pre-suppose this physiological basis. Even, Aristotle, for instance, believed that "all higher forms of knowledge are built on pre-existent knowledge,

the origin of which is to be sought not in pure reason, but in perception, experience, memory and the ability to learn"[30].

With Descartes, Aristotle maintains that language is a species-specific characteristic. It is only the human beings among the sentient being that possess and use language. No animal species except humans display linguistic behavior in the sense of using appropriate contexts. Descartes, further argues that human mental activities, particularly in "the use of language" and exercise of the will could not be possibly explained or predicted by means of mechanical laws. As Descartes writes: "It is a very remarkable fact that there are none so depraved and stupid without even excepting idiots that they cannot arrange different words together, forming of them a statement by which they make known their thoughts, while, on the other hand, there is no animal, however perfect and fortunately circumstanced it may be which can do the same"[31].

For Descartes, animals do not possess any reason at all. Human abilities "think", to decide and to use language creatively could not be accounted in any way for animals. To explain the distinctively human abilities Descartes used his notion of "innate ideas" that are there in an '*immaterial soul*' or '*res cogitans*' or 'a *thinking subject*'. That was conceived by him and his followers as to be utterly

[30] Cf., Arde Denkel, *The Natural Background of Meaning*, Blackwell publishers, New York, 1999.
[31] Morton Emmanuel Winston, '*On Chomsky*', Wadsworth Thomson Learning, Belmont, 2002, P. 28.

distinct from the physical body. The human mind for Descartes was equipped by 'God' with a natural light of reason by use of which human beings could attain reliable knowledge of the natural world. Thus, Descartes denies that human language is evolved from the communicative system of animals.

Noam Chomsky, like Descartes maintains that the humans derive language from "*Universal Grammar*" which they possess innately. Chomsky supposes that is due to the privileged structure of the brain, something that species has acquired as a result of mutation. Language is not evolved, there is no continuity between language and animal communication. Chomsky argues: "A person who knows a language has mastered a set of rules and principles that determines an infinite discrete set of sentences each of which has a fixed form and a fixed meaning or meaning potential. Even at the lowest level of intelligence, the characteristic use of this knowledge is free and creative in the sense just described and in that one can instantaneously interpret an indefinitely large range of utterances with no feeling of unfamiliarity or strangeness..... if this is correct, then it is quite pointless of speculating about the "evolution" of human language form animal communication system"[32].

[32] Noam Chomsky, Language and Nature, *Mind,* V, 104, 1968, PP. 1-613. .

For Chomsky, 'animal language' or 'body language' is in his terminology called 'animal communication system'. The communicative mechanism of humans and the animals are radically different from one another. And thus he uses "language" as criteria to differentiate the communicative patterns of human beings from the rest. By this Chomsky, assumes that it is only humans that have this capacity to use language and nothing that is used by animals in their communication qualifies as truth that corresponds with the definition. The valid conclusion that can be drawn from his observation is that: "language itself, in a strict sense, has not evolved or gone through different stages of development and complexity; we cannot infer however,.....human language has not evolved from forms of animal communication"[33]. If it is true that one does not encounter languages (in Chomsky's restricted sense) that differ in their level of complexity, extent and representative efficiency, one can conclude that language has not evolved. But the same observation does not seem to lend support to the thesis that language is not a transformation of something else, namely of systems of communication that do differ in complexity, extent and representative efficacy.

When meaning and communication, undergo an evolutionary development there arises the language. Language, as the end result of the evolution of animal

[33] Arda Denkel, *The Natural Background of Meaning,* Kluwer Academic Publishers, London, 1999, P.65.

means of communication should have acquired other functions. But an evolutionary approach to communication and meaning does not mesh with Chomsky's positions, but it does not conflict with his reasons either. It remains unscathed by them. There seems to be a total absence of a background developmental preparation within the phylogeny of animal communicative patterns. In other words, how does the mutation responsible for the sudden emergence of language take place? There seems to be no reasonable account suggested and also the concept of "miracle" can hardly be underplayed.

Therefore to get a better idea is to discuss the natural and artificial types of communications that will correspond neatly with the divide between animal and human on one hand, and animal systems of communication and human language on the other.

At the lowest level or basis of evolutionary succession we find natural signs (indications) of the inanimate world, such as the sound of thunder somewhere meaning that lightning struck there. At the highest stage are linguistic utterances that are sentences with full meaning and reference. In between are forms of meaning created in different patterns of instinctive animal communication, the pre-linguistic intentional and pre-linguistic conventional types of communication.

Descartes stated that cognitive states and attitudes such as beliefs or intentions cannot be attributed to organisms (even to sentient being) unless they are manifested by language. These views follow directly from Descartes' dualism which has always taken the thinking substance as independent from matter, so that such a substance proves to exist by criteria that makes no appeal to the physical world. In claiming something exists as a mental substance there is no need at all to use criteria concerning bodily traits. Every person, he says, has strong grounds for affirming its own existence as a mental entity, independent of the body, and there are chances of him knowing one another. Further, one cannot know the existence of other minds directly as how he knows his own mind. Though the behavior manifested by bodies and machine resemble, yet one cannot use such a resemblance as an indicator of thought, that would seem to be delusive. Automata do not function from the impulses of the individual soul associated with them. Therefore, the dualist implements criteria wherein a distinction is made between bodily behaviour that indicates the existence of thinking being and behavior that does not.

Interestingly even Russell acknowledges primacy of language when he says: "language comes first and thought follows in its footsteps."[34] And once a

[34]Cf., T.P Waldron, *Principles of Language and Mind: An Evolutionary Theory of Meaning,* Route ledge and keg an Paul, London

person learns to speak, language provides us with new psychological dimension that is quite distinct from animal reaction to stimulus or sign. This is also evident in Piaget's work on language development.

Jean Piaget made an attempt to organize the material collected around the concept of egocentrism. He examined language from the point of view of the subject and not from the cold external viewpoint of the objective observer. This led Piaget to attempt to arrange his material into two types of linguistic exchanges and stages in the development of the conversation among children aged from 4 to 7. This progression thereby could be compared with their verbal explanation, their understanding of order, cause, justification, reality, history, human action and rules and regulations.

For Piaget, language serves multiple functions along with the age. This implies that Piaget sees the development of language from the evolutionary perspective. Piaget argues "that the acquisition of language is a product of the development of intelligence during the sensori-motor period (0-24 months) and the associate capacity symbolic (or semiotic) representations. This occurs in the form of the semiotic function which includes symbolic play, deferred imitation and mental imagery. The onset of language is associated with the development of symbolic representation which is dependent upon the progressive and

internalization of sensory motor action scheme"[35]. At first, language for Piaget is plainly "echolalia" or "repetitive". The child at this stage repeats what he or she has understood from the speech of others. Next, the child gets interested in his/her own linguistic production and repeats words for the pleasure of talking, which is then still "echolalia". Monologue takes place when the child talks to herself. This is followed by a collective monologue. Here the child uses the presence of others as a stimulus for his or her own verbal productions. These functions of speech are all egocentric as in contrast with socialized speech that serves other functions such as the exchange of information, criticisms,. commands, request, threats and questions and answers. Having recognized the different functions of language, Piaget arranges the different types of conversations in the development sequence. Piaget recognizes that explanations given by one child is purely "egocentric" which means " explanation are not conceived by children between 6 to 8 years of age as an effort of decentration that is taking the position of someone which does not know"[36].

The child does not attempt to adapt her explanation to the viewpoints of others. For instance, a child of this age will tell a story without putting the

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[35] (Jean, Piaget, Dialogue III, *Jean Piaget's views on the psychology of language and thought.*), In R.W. Reiber and G.Voyat(eds)., "*Dialogues on The Psychology of Language and Thought: conversations with Noam Chomsky, Charles Osgood, Jean Piaget, Ulric Neissen and Marcel Kinsourne*", Plennum Press, New York, P. 107-120.

[36] Gruber and Voneche, *The Essential Piaget,* Routledge and Kegan Paul, London, 1977, P. 66.

different sequences of the story in the right order. Rather the child will tell the story in the order in which she remembers the different passages that are neither logical nor historical. And accordingly, the necessary ordering of cause and effect will be altered. In sum, the child of this age behaves as if everyone already shares the same knowledge that s/he has. From the age of 9 to 11 years, the egocentric speech gives way to a form of verbal and conceptual syncretism that is characterized by a need for justification at any price. The child at this age immediately takes a leap from the statements to the conclusion. The child tries to link everything with everything.

Language enables an individual to communicate his thoughts to others. This is not simple. An individual may convey different modes of thought in different ways. At one point of time, the adult may use language to assert, at other times to state objective facts or convey information, for instance, 'the weather is changing for worse', 'bodies fall to the ground'. Language is also used to express commands or desires, to criticize or threaten in words, to arouse feelings and provoke actions such as "let's go", "how horrible", etc. On the other hand the function of the child's language may be divided into two large groups namely the "egocentric" and the "socialized". When a child utters an egocentric phrase, he does not bother to know to whom he is speaking nor whether he is being listened

to. The child here talks either for himself or for the pleasure of associating anyone who happens to be there at the moment. At this level, the talk of the child is "*egocentric*". This is partly because the child speaks only about himself, but chiefly because he does not attempt to place himself at the point of view of his hearer. The egocentric speech of the child is divided into three categories. (a) Repetition (echolalia) this involves the repetition of words and syllables. A child only repeats words for the pleasure of talking with no thoughts of talking to anyone, also imitates sound, even those which he hardly understands the meaning of. According to Claparede, "imitation is an idea motor adaptation by means of which the child reproduces and then stimulates the movements and ideas of those around him"[37]. (b) Monologue--in this the child talks to himself as though he were thinking aloud. He does not address anyone. (c) Dual or collective monologue--this is the most social of the egocentric varieties of child language. There is an outsider that is associated with the action or thought of the moment, but is expected neither to attend nor to understand. In this the child does not speak to anyone, he only talks aloud to himself in front of others- but here the child is conscious of the audience. This can be compared to the way certain men and women of a puerile disposition (certain hysterical subjects, if hysteria be described

[37]Ibid..... P. 71.

as the survival of infantile characteristics), who are in the habit of talking aloud as though they were talking to themselves but are also conscious of their audience.

Socialized speech can be distinguished into adapted information, criticisms, commands, requests and threats, questions and answers. In adapted information there is the exchange of thoughts with others. This is done by either telling his hearer something that will interest him and influence his actions or by an actual interchange of ideas by argument or even by collaboration in pursuit of a common aim. This takes place only when the child adopts the point of view of his hearer and when the latter is not chosen at random. Criticism includes all remarks made about the work or behavior of others, but having the same character as adapted information, in other words, remarks specified in relation to a given audience. Commands, requests and threats include a definite interaction between one child and another. Most of the questions asked by children call for an answer and can therefore be classed as socialized speech. By answers is meant answers to real questions that is with interrogation marks and not to command. Answers are given to those that contain information.

Critically viewed, Piaget does not define sharply the terms in his discussion and tends to vacillate among several distinct meanings, especially of *ego-centricism.* Of the several meanings among which the term "egocentrism" wavers,

the most deeply entrenched appears to be that children take their own point of view to be absolute. To support this account, Piaget would have to point to a kind of behavior in which children attempt to communicate and fail because they think their point of view is absolute. He draws on two categories of observation neither of which involves this kind of behavior. The first category is the observation of talk that is self stimulative or in other ways directed to the self. This behavior is not egocentric in the sense Piaget wants to show that it is, because children are not trying to communicate. The second class of observation consists of cases in which children are clearly attempting to communicate but fail because they lack the ability to take the listener's point of view. Cases of this kind are not clearly egocentric in the sense that Piaget wants to show that they are, because it is not clear whether these children are taking their own standpoint to be absolute. On the one hand, Piaget says that when children are exhibiting the cardinal features of egocentric speech they do not want to, or are not trying to communicate, on the other hand, he also says that the communication embodied by such utterances is egocentric. Children are not speaking from the point of view of their audience and instead are taking their own point of view as absolute. If they are not trying to communicate, how can we say that their speech is egocentric, in the latter senses? If we want to say that this speech is egocentric, then we have to say either that if

the speech were intended as communication it would be egocentric, or that the intention itself is egocentric.

The weakness of the first alternative is obvious. The speech is not intended as communication. The second alternative is also problematic because it is not at all clear whether the children's actual intention is egocentric. These children are simply doing something other than communicating; part of this activity involves talking, when talking is conventionally reserved for communicating.

Another important aspect of language is its relation to thought processes that is how language and thought are related to one another. Gilbert Harman rightly stated that "Language makes thoughts possible. Learning language is not just learning a new way to put thoughts into words; it is also learning a new way to think"[38]. Again, there has been a long standing discussion on the relationship between thought and language in the western philosophy that can be traced back to Greek period. It is possible to identify certain broad traditions in the philosophical study of thought and language, traditions that have their representative in both psychology and linguistics. Plato and Socrates answering the question 'what do you mean by thinking?' reply : "As a talk which the soul has with itself about

[38] Gilbert Harman, *Thought*, Princeton University Press, Princeton, New Jersey, 1973, P.. 84.

objects under consideration"[39] This view indicates that there is a logical or 'internal' connection between thought and language: thought just is the discourse of the mind with itself. There are parallels between thought and language as recognized by the language theorists. Thought and utterances exhibit semantic parallels, not only are both entitled or meaning, reference and truth and falsity but the thought that 'P' and indicative statement 'P' produced in otherwise identical situations must have the same meaning reference and truth value. What makes language "language" in Dummett's words is the idea of the philosophy of language. This is basic to all philosophy. The point above seems to be facts about language, our language, the language that we have and use in science and in everyday life. The general concept of language presupposes within the discussion of theories of meaning. For Plato and Descartes, who does the thinking is the 'rational part of the soul' rather than the whole human being. Many of the current debates on the relationship between thought and language bear their imprints on what the 'Father of Modern Philosophy' has said. Cartesian metaphysical framework interprets the idea of thought as something inner, hidden and private. The person starts from the inside, from our internal reflections and cogitations and then by a problematic and circuitous route move outwards, to the public world of

[39] John Preston, '*Thought and Language*', Cambridge University Press, UK, P. 1.

communication. This Cartesian Meditator has had a curious dual fate in 20th century, as majority of the philosophers have deeply suspected it. Descartes, however, devoted most of his career not to metaphysics but to science. In his scientific correspondence and in discourse Descartes unequivocally advanced the claim that there is no thought without language. And in arguing for this claim, Descartes creates language, throughout, as an objective interpersonally fixed phenomenon, subject to firm external criteria for what can count as its genuine instantiation and maintains that we are quite mistaken in attributing any kind of thought to non-human animals given that they lack genuine language. Though animals and other forms of animal life do not think, certain gestures that reveal are instances which the pre-philosophical intuitions of the great majority would classify as involving without thought. Descartes well known view,was that despite many apparent and distinct similarities between our behavior and that of animals, animals are not endowed with thoughts and there are no souls interactively united with animal bodies. To show that his view was correct and attractive, Descartes employed the criterion of linguistic behavior, wherein he stated that an organism who has the capacity for using a language is a conjoined with a necessary and sufficient condition for the possession of thought. In the sense of being united with a soul. In Descartes words: "In fact, none of our external actions can show

anyone who examines them that our body is not just a self moving machine but contains a soul with thoughts with the exception of spoken words or to her signs that have reference to particular topics without expressing them" [40]. Hence, linguistic behavior indicates the presence of thoughts. And this is the reason why animals cannot speak like us. It is not because of deficiency in their relevant organs but because, they lack the faculty of thought. Descartes regarded speech behavior as necessary conditions for thinking as well the sufficient condition.

Descartes views were considered as inadequate and were faced with the following criticisms. First of all it makes the idea of thinking animals (and more generally, that of thinking machines) a genuine possibility, and thereby allows that animals and machines may possess souls (res cogitans). Second if there is reason for denying that the use of language is a necessary condition for the presence of thought in a physical entity, then there must also be reason to deny that language is the only certain sign of thought, or reason to allow that there are thinking beings whose thought is never manifested by a sign at all. In fact Descartes regards the use of language only as inconclusive evidence for the presence of thought, neither as a necessary nor a sufficient condition of it.

[40] Arde Denkel, *The Natural Background of Meaning*, Blackwell Publishers, New York, 1999, Pg. 69.

Therefore the two Cartesian claims the privacy of thought and the linguisticity of thought hardly look compatible. If thought is entirely and essentially private, then there seems to be no conclusive reason for restricting it to language users. For sometimes we know, cats and dogs might have inner mental life.

Cartesians may support their point by stating that retarded people invent some form of a communicative system clearly recognized by their caretakers, and hence even these individuals have a language. The same criterion of Cartesians may embarrass them as it will force them to acknowledge the so called "artificial intelligence' of some machines as genuine thoughts. These may hardly be compatible with Descartes own purposes. He may agree that machines, like some animals may surpass humans in the efficiency of their skill in some narrowly restricted area of performance. But there is no proof that they have a faculty of thought. In yet other areas, the same machines or animals will be totally devoid of skill in contrast with humans whose abilities spread to all areas of practical concern. As Arde Denkel points out "although such machines might execute many things with equal or perhaps greater perfection than any of us, they would, without doubt, fail in certain others from which it could be discovered that they did not act from knowledge, but solely from the disposition of organs: for while reason is an universal instrument that is alike available on every occasion, these

organs, on the contrary need a particular action "[41] Descartes, strongly blocks every possible justification that animals have a mind, and declares that such a thing is morally impossible. It is morally impossible that there should exist in any machine a diversity of organs sufficient to enable it to act in all the occurrences of life in the way in which our reason enable to act. By means of these arguments and views what Descartes wanted to prove is that it is only the humans that possess a thought and there is close proximity between language and thought. The view was further supported by other contemporary thinkers.

A stronger argument than Descartes' was put forth by Quine and his followers. Quine declared that when we attribute intentionality to the behavior of animals without speech, we commit the mistake of putting ourselves in their place, where such a thing is an unwarranted intellectualism. In Quine's own words: "we find ourselves attributing beliefs, wishes and strivings even to creatures lacking the power of speech, such is our dramatic virtuosity. We project ourselves even into what from his behavior we imagine a mouse's state of mind to have been and dramatize it as a belief, wish, or strivings verbalized as seems relevant and natural to us in the state thus feigned."[42]

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[41] Arde Denkel, *The Natural Background of Meaning,* Blackwell publishers, New York, 1999, Pg. 73.
[42] Willard Quine, '*Word and Object*', The M.I.T. Press, Cambridge ,Massachusetts, Pg. 75.

According to Donald Davidson, the attribution of intention and belief to creatures is valid only to the extent that such creatures manifest behavior that can be interpreted as speech. Any behavior involving less than the complexity of speech will severely undermine our intentional interpretation of such creatures. According to Davidson, without speech we cannot make fine distinction between thoughts that are essential to the explanations. When we attribute attitudes, we should ensure that all the expressive power of language can be used to make such a distinction. Davidson considers 'necessary condition' as an ascription of thoughtfulness (that is of intentionality), to the behavior of such a creature. But again the views of Donald Davidson's suffered criticisms. However, if Davidson's criterion is applied strictly to the behavior of animals, then no action that falls outside can be said to be intentional. If this is the case, then even simple actions of humans will be treated as unintended that may in turn result into disastrous consequences. Taking an example of an assassin's act of pulling the trigger may be classified as unintended, thereby making him free from any responsibility.

Much of what we do as thinking creatures and interpret actions fellow human beings can be at once intentional, non-linguistic and simple. For example: stretching the top shelf, opening the newspaper, chopping onions, do not embody

intrinsic complexity. Moreover much of the communicative action we perform among ourselves, such as the smiles, glances, facial expression, postures, tones of voices and mannerisms we often display is structurally simple, yet non-linguistic, not carried instinctively. Such non-verbal communication plays a very important part in our life. Endorsing Davidson's thesis without proper qualification implies ignoring the liveliest aspect of our communal life. Therefore to obtain a useful criterion from Davidson's conditions we should firstly regard the capacity for behavior as complex as speech as a necessary conditions for a creature's ability to think. Instead of supposing that only speech behavior is thoughtful and intentional, we should require that only creatures that can produce behavior as complex as language can act by decision, can think and be responsible for their deeds. Under reasonably acceptable circumstances other behavior in such creatures should be recognized as thoughtful.

A similar question arises within the boundaries of human language. Why only articulate and most developed versions are taken as paradigms of language? There is no doubt that human language can be used most powerfully. Keeping the actual performance aside, why should one take, for example, a novelist's or philosopher's competence a paradigm of language? There are modest users of language, whose knowledge is restricted to not more than a few hundred words

and a limited number of grammatical forms. Their competence of language hardly exceeds the degree they are capable of making actual use of it in performance. Possession of language is not acquired all at once and as a whole. People learn only parts of language and may or may not extend their mastery to that of a literary person. Some individuals who lead simple lives in isolated environments can perform and follow only a fraction of a novelist's command of their language. Thus a person's linguistic performance does not reveal all his competence, which is his grasp of language conceived ideally. An individual competence cannot be identical with a complete and ideal grasp of language. There is a reason for thinking that language is the competence of man. An individual is not an idealized full fledged system, but only larger or smaller parts of the full system. Consider the language of pre-linguistic infants. They establish their initial communicative interaction with their caretaker. Further, infants of about 12 months of age do not manifest behaviour based on beliefs and intentions as complex as those encountered in adults. We see that infants at such a stage of development engage in an intense non-linguistic communicative relationship, which is essential to the organization of their lives, for learning skills and acquiring the adult language. But many a times it so happens that pre-linguistic infants convey messages that are equal to that of adult's nonlinguistic behavior. This has been supported by the

developmental psychologist who states that infants who display behavioral tendencies such as insistence, rejection, request, joy and satisfaction bear a great similarity intone of voice and emphasis to those of the adults. But there has been objection put forth by the followers of Davidson, where in they say that the types of behavior at hand are not complex at all, and furthermore, that in all likelihood pre-linguistic infants simple stimulate the actions of adult humans as even pets do –rather than behaving intentionally. From such a point of view only adults can be said to display such speech like communicative behavior, and consequently only they and not infants and animals can be credited with thinking.

In the words of Arde Denkel "in case of pre-linguistic children Descartes' position, too, encounters difficulties. If, on the one hand, one regards the use of language as the sole evidence for the possession of thought , and on the other, insists that the same thing makes it possible to distinguish human from animals, logically one will be led to affirming that pre-linguistic children are soulless automata, and to treating them like sub-human animals. Such a consequence is a theoretical disaster"[43]. It generates questions like how does the same creature soulless in the beginning, come to acquire a mind in due course? And how can soulless infants possess innate ideas? Descartes' answer can be predicted, by

[43] Cf., Arde Denkel, *The Natural Background of Meaning*, Blackwell Publishers, New York, 1999.

extrapolation from his attribution of innate ideas to infants who are not capable of expressing them in words. He would declare that language is in the minds of infants as a potential a capacity that will actualize with the child's acquiring maturity. Locke's answer to this kind of strategy has been that since we cannot do anything we have no capacity for, for anything we have achieved we must have had capacity for right from the beginning. Absurdly therefore, on Descartes' view everything we are capable of manifesting must be inborn.

Coming to Davidson's thesis, for the intentional explanation of non-linguistic behavior to be underdetermined by data available, the attribution of thought to the creature must indeed contain distinctions. What gives force to the thesis of underdetermination is the contrast between the subtlety of the content of thought and the relative simplicity of behavior. The more finely discriminating thought we attribute to a creature, the greater the number of alternative explanations we have of its behavior. But when we attribute thoughts and intentions to human infants, or to higher animals, we do not have to make fine distinctions. On the contrary, generally we do not conjecture that infants or animals think in the finer and more elaborate ways human adults do. Far from fulfilling the assumption that lends force to Davidson's argument (that is the attribution of finely discriminating thoughts and intentions), those who suggest

that a dog possesses some primitive form of belief that its master is home are highly unlikely to maintain that the animal is in a position to know that Mr. Smith, the bank manager is home.

In the beginning of the 20th century, the relation between thought and language was debated within a new context. In the seminal essay of Frege, "*uber sinn und bedeutung*" (1892) and his 1894 review of Edmund Husserl's '*philosohie der Arithmetik'*, the German logician Gotlob Frege insisted upon distinguishing between the *objective content* and the *subjective performance* of thinking. The former, that which can be thought, is capable of existing without a thinker, and of being the common property of several thinkers. The latter, the psychological episode in which the former is 'apprehended' or grasped, must have a bearer. The objective content of thinking, Frege called 'the thought' (der Gedanke), and he identified this with the 'sense' of a sentence, that which is capable of being true or false.

Frege conclusion was that over and above the things of the 'outer world' (material objects) and those of the 'inner world' (psychological phenomena) we must recognize a 'third realm' whose contents cannot be grasped by the mind until they are dressed in language. In this conception, thoughts can and do exist independently of our grasping them, thinking consists in grasping them with a

special mental capacity, and judging consists in taking the thoughts thus grasped to be true. The view is of language theorists not because it represents thoughts as linguistic, but because it construes thinking as coming to stand in a relation to 'objects of thought', these objects being the 'senses' of sentences, those things which are true or false.

As in the case of Russell: "To think, assume, believe, know, expect, remember, desire, hope, fear etc. are all different psychological relations to propositions, to believe that 'P' is to believe the proposition that 'P'[44]. For him each thought consists of an object (the proposition to which it is directed) and an attitude (the manner in which the subject is disposed towards the object). Russell later on changed his mind about what propositions are and conceived each of them has linguistic and sometimes as non-linguistics.

Micheal Dummett also tried to draw the conclusion about the nature of philosophy itself. But Dummett was criticized and rejected the claim that the difference between 'analytical philosophy' and philosophies from continental Europe influenced by phenomenology can be traced to a contrast between the philosophy of language and the philosophy of thought. He traces, the idea that the basic task of philosophy is to analyze thought back to its 19th century roots,

[44] Nicholas Griffin, ed., *The Cambridge Companion to Russell*, Cambridge University Press, 2003, pg. 128-70.

showing how the Kantian concern with representation was transformed by the 'linguistic turn' of the early 20th century instigated primarily by Wittgenstein.

Ludwig Wittgenstein's "Tractatus Logico Philosophicus' (first published in 1921) states "it is becoming clear why I thought that thinking and language were the same. For thinking is a kind of language. For a thought too, of course, a logical picture of the proposition and therefore is just a kind of proposition."[45]
In his picture theory, a proposition is both an expression of thought (3.1) and a logical picture of reality (4.01). On the 'Tractatus" too a thought, is a logical picture of facts, which means that the though that p must consist of psychological elements arranged in the same way as the elements of the propositional sign "p". This theory of Wittgenstein was endorsed earlier by John Locke for whom the primary function of language was to communicate thoughts by using perceptible signs to effect a correlation between the 'mental state' of the speaker and that of the hearer. Though Early Wittgenstein insisted that thoughts do not consist of words he admitted that they are composed of 'psychical constituents that have some sort of relation to reality as words. However, the relationship between pictures, language and thought is not transparent.

[45] John Preston, *Thought and Language,* Cambridge University Press, UK, P. 5.

W.V. Quine, well known critique of the analytic and synthetic distinction has it that philosophy is continuous with linguistics and psychology in forming part of an amalgam known as 'cognitive science'. This lingualist view received its canonical defense in Fodor(1975). In his book, 'The Language of Thought' Jerry Fodor, aimed to resurrect the traditional notion that there is language of thought. Jerry Fodor explicitly tried provide an underpinning for cognitive theorizing. He sets out for the first time, the philosophical and the methodological presupposition of the kind of psychology, arguing powerfully that contemporary cognitive theorizing clearly presupposes not only that there must exist a language of thought, but also that cognition consists in computative operations upon sentences of that language. R.C.Pradhan states that "Thoughts shares the structure of language and therby become intelligible. Without language thought itself would have lost its intelligibility"[46]

Language and Reality.

The Language-reality connection is established, on the traditional view, via meaning, that is intention or connotation or sense. In this traditional view, which is usually given the names 'description theory of meaning' and 'sense theory of reference', meaning or intension or connotation or sense is a conjunction of

[46] R.C.Pradhan, *Recent Developments in Analytic Philosophy,* Indian Council of Philosophical Research , New Delhi, 2001, p. 201.

properties or descriptions expressing this conjunction which is associated with a term; and it is this conjunction or the description of it which determines what the extension or denotation or reference of the term is.

The question of 'meaning' and theories of meaning have puzzled philosophers over the years and a whole tradition of philosophical thought has evolved as many philosophers have tried to grapple with these questions. There are various questions raised with regard to the concept of meaning. How do we understand what others mean? How do children learn the meaning of words? How is the meaning of one term related to the other term? Do proper names have meaning?

There are quite a few theories that try to answer the questions mentioned above. The simplest one among all is the referential theory of meaning that takes proper names as the typical unit of meaning. The meaning of a proper name is the individual whose name it is. For example the meaning of the name 'Socrates' is the designated individual. As a result, the concept of reference became central to such a theory of meaning. Not only the referential theory, but all the traditional theories regarded 'reference' to be central to the question of meaning. This was mainly because philosophers thought that any theory of meaning to be acceptable must explain how the connection between a word and its referent, that is, between

language and reality is established. Reference being, so to speak, is the paradigm of the connection between language and reality. Both in fact, the paradigm and the nodal point- a theory of meaning has traditionally been conceived as that very theory which explains how our language relates to reality.

Therefore in an evaluation of a theory of meaning in the traditional mode one needs to consider whether theory of meaning can serve the purpose of explaining reference or whether it serves to explain the language-reality connection. The traditional perspective of meaning is subject to criticisms in recent times.

Recent critics of traditional perspective have reservations against the view that reference is central to the question of meaning. These philosophers prefer to address the question in a different way, so as to avoid difficulties they found in addressing the question in a way which makes reference to be the central concern of the theory of meaning. This view evolved with the shift from atomistic theories of meaning to molecular and holistic theories of meaning. The most significant is Quinean thesis of inscrutability of reference. Quine's 'Inscrutability of Reference', states that "no empirical evidence relevant to interpreting a speaker's utterances can decide among alternative and incompatible ways of assigning referents to the word used; hence there is no fact that the words have one

reference or another"[47]. Although this doctrine is similar to indeterminancy of translation, they are not identical. This is because inscrutability of reference might be compatible with the different interpretations of the speaker all sharing the same truth-value, whereas indeterminancy according to Quine require that the different interpretations stand in no kind of equivalence, so that on one interpretation what is said might be true and on another false. Secondly, translation might be indeterminate even though reference is scrutable, if, for instance, it is a goal of correct translation to fix more than the references of terms.

There were many theories that made 'reference' central to the concept of meaning, but at the same time faced many difficulties. Taking into account the referential theory of meaning, which was the simplest among all considered meaning to be closely related with the question of reference. However it was criticized by Frege, where he says" two expressions may have same reference yet may differ in meaning"[48]. The other criticisms that were leveled against this theory were that not all items of language can be said to have reference. Most referential theories fail to explain what connects expression to their reference and

[47] Cf., Roger F. Gibson Jr., *The Cambridge Companion to Quine,* Cambridge University Press, Cambridge, 2003.

[48] Madhu Chandra Sen., "*Is The Question of Meaning a Question of Reference*?", Jadavpur Journal of Philosophy, Vol. V, No.1, 1993, P. 15.

also how such a connection comes about without bringing in the role played by language users in establishing such a connection.

In the light of critics, it seemed that the ideational theory was a better and more adequate account of the connection between words and their referents. It was John Locke, an eminent advocate of the ideational theory among the classical theories who regarded meaning as "mental entities" (subjective ideas). This view of Locke was an inspiration that he took from Aristotle. Mentalist account takes meaning as something private that is as an entity inaccessible to any mind other than the one possessing it. Meaning is totally independent of the mind. Many affirm that meaning transcends the individual minds; it is shared by plurality of people. In Aristotle's view, abstract contents in our minds or in his preferred terminology "affections in the soul" are representations of objective entities.

Accordingly Locke believed our "words to stand also for the reality of things"[49]. Unless meaning had an objective aspect we would be incapable of breaking through the privacy of our minds and thus would fail to convey our thoughts to one another. For Locke, there is always an intimate relationship between thought and meaning. Thought becomes communicable to other individuals by a meaningful utterance, and the latter that are meaningful utterance

[49] Arde Denkel, *The Natural Background of Meaning*, Blackwell Publishers, New York, 1999, P. 36.

exist because of our desire to communicate thoughts. The main concern of Locke's enterprise was to explain how private and 'mental' thoughts are conveyed to others. It is in the context of communication that meaning manifest its empirical aspects. Meanings are reliably linked with observable features, and thought such links the private conditions of organisms are made public. These links constitute the most important feature of communication. The success of communication between individuals depends, therefore, on the existence of connection of which one term is an utterance and other qualifies as its meaning. Locke's theory accounts for why there are meanings and how they relate to utterances.

In Locke words" "speakers make utterances (words or sentence) stand for ideas (representation) or thoughts (composed of such representations) that are identified as meanings (Signification). Words are sensible marks of ideas and the ideas they stand for are their proper and immediate signification. Words in their primary or immediate signification stand for nothing but the ideas in the mind of him that uses them."[50]

Austin, proponent of ordinary language philosophy, studies the relationship between language and reality and he says, "when we examine what

[50] Ibid....P 48.

we should say when, what words we should use in what situations, we are looking again not merely at words, but also at the realities we use the words to talk about. We are using a sharpened awareness of words to sharpen our perception of, though not as the final arbiter of the phenomena"[51].

For this reason Austin thinks it might be better to use for this way of doing philosophy some less misleading name, than those above, for 'linguistic phenomenology. Further, Austin's methodological notion of 'linguistic phenomenology' has been proposed as a key to explaining the ordinary language philosophy, practiced both by Austin, Wittgenstein and their followers. The reference to linguistic phenomenology seen in Austin work titled 'a plea for excuses' where "he is attempting to make clear his understanding of the methodology of ordinary language philosophy. That methodology as he puts it, is one of examining what we should say when, and so why and what we should mean by it"[52]. According to Austin linguistic phenomenology, "is to be understood as a technique for grasping non-verbal, real distinctions by reflecting on the verbal ones"[53].

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[51] J.L Austin, *'A Plea For Excuses' in Philosophical Papers*, Oxford, 1961, pp. 123-52

[52] J.L Austin, *'A Plea For Excuses' in Philosophical Papers*, Oxford, 1961, pp. 123-52 .

[53] Robert L. Arrington, 'Can There be Linguistic Epistemology?' *The philosophical Quarterly*, Vol. 25, No.1, Oct. 1975, P. 289.

Our object is to imagine the varieties of situations in which we make exercises and examine the expressions used in making them. Austin recommended two things, namely the thorough use of a dictionary and a study of psychology and its means of classifying actions and their explanations, which classifications may differ from those employed in ordinary language. This recommendation states that ordinary language is not a fixed body of usage but one which evolves and which also incorporates vestiges of supersititions, error and fantasy. While presenting a more elaborate explanation of linguistic phenomenology, he says "we are to grasp the realities and distinctions in the world by looking at the forms and distinctions of ordinary language and secondly, we are to prise words off the world so that we can both look at the world without linguistic blinkers and judge the adequacy of language"[54]. By this we sharpen our awareness of phenomena by looking at the language we use to talk about them. The above words of Austin state that we grasp the realities of the world through language an also look at the world independent of language, with language 'up against it'. In the actual philosophical practice, Austin opts for proposal one, while doing philosophy he appeals to what it makes sense to say rather than engaging in language-world comparison.

[54] Ibid ....P 291

Austin was aware and impressed by the problematic of the procedure, as it was evidenced by his ambivalence toward ordinary use, his reference to its occasional inadequacies and his explicit attempt to justify the appeal to ordinary use as the first if not the last.

Austin felt the need it is necessary to defend the practice of consulting what we say when against the charge of illegitimate ontolizing the charge of falsely assuming that language offers us a map (existential reference) of linguistic distinctions and types on the grounds that we have found these distinctions. Types worth drawing and marking in the course if our historical experience.

In his discussion Austin proposed to study language in order to get a better view of the world. But as he understood language as something grounded in experience and as something that might be compared with the world, he was concerned with the problematic of his method of linguistic phenomenology. He felt the need to give a prima facie justification for studying what we say when, while at the same time providing us with an extra-linguistic check in our verbal practices and an advance warning of the pitfalls involved in them. Austin realized the adequacy of words only as contingent matter. Austin failed though to provide a complete justification for studying what we say when, and prospects for the extra-linguistic check methodology.

A study of Jean Piaget's position may provide the missing links in linguistic phenomenology and consequently provide a better understanding of the relationship between language and reality.

CHAPTER III

JEAN PIAGET AND PHILOSOPHY

In this chapter, an attempt is made to understand the thoughts of Jean Piaget on Philosophy, which were influenced by his conception of biology. A detailed discussion of Piaget's general framework of philosophy can be seen in his work '*Insights and Illusions of Philosophy*', which resulted in a new philosophy, namely, '*epistemologie genetique*'.

Reflecting on the nature of philosophy, Piaget argues that recent continental philosophy has turned away from the empirical world and concentrated upon 'introspective description'. He sees this in contrast with great past philosophers who were interested in scientific question, which in turn affected their mode of thinking. Piaget, however points out that although philosophy provides a matrix for the development of sciences such as logic, psychology and sociology, it can only give us 'wisdom' and not 'knowledge' in the real sense of the word as science does. In this connection, Piaget examines the attempts of Husserl and others to introduce a mode of knowledge specific to philosophy and of a logically higher order than science. The attempts to look for it in an elementary act of consciousness (that is the intentional act), which gives us knowledge of 'essences' suffers from the drawback that such acts seem to be a feature of sophisticated adult consciousness. For Piaget, however, adult intellectual activities are conditioned by earlier forms of behavior. Going back to empirical traditions of British Philosophy and Piaget's views, as far as methodology is concerned the school

of conceptual (or linguistic) analysis, had certain affinities with that of phenomenology. For example, the view that empirical questions are irrelevant to philosophical ones and that philosophical discussion of conceptual thinking are concerned with questions of validity and not of origin. Genetic (historical) dimension is therefore excluded because, it is concerned with the process of discovery and not justification. The philosopher is interested only in the justification and not the origin. This provides a two-fold reason why it tends to be regarded as a form of knowledge. Speaking in this manner will be relative only to modern man, for whom there exists a more or less clear cut difference between science and philosophy. The most important reason, which is a historical one, says philosophy has always been considered as a form of knowledge in our western civilization. It has long been bound up with science, from the time of the earliest Greek thinkers, for whom the distinctions between science and philosophy did not exist. When the Pre-Socratic began to think about reality in a rational manner and no longer in the symbolic language of the myth, their conceptions of the world involved at one and the same time philosophy and physics as in the case of the school of Miletus, or mathematics as in the case of Pythagoreans.

It is important to note how this connection with science has remained alive for so long. This is also the characteristic of western rather than oriental thought. There is also a need to recall that there are no differences as far as nature is concerned between philosophical and scientific cognitive problems. They only differ in their delimitation or specialization and above all in their methods, which are either purely reflective or based upon systematic or experimental observation in the case of facts and rigorous algorithms

in the case of deduction. Piaget, therefore states "It is relatively easy, to know broadly on which matters a philosopher has engaged in scientific activity or to which he has tended to have a scientific attitude(since this is primarily a matter of approach and not of boundaries in the static sense), and those about which he only philosophizes"[55].

It seems undeniable that the most important systems in the history of philosophy, which have given rise to others and which have themselves had a lasting influence, have all arisen from a reflection on the scientific discoveries of their authors themselves or on a scientific revolution occurring in a period in which they lived or immediately preceding it. Consider for instance Plato, who was concerned with mathematics, Aristotle with logic and biology, Descartes with algebra and analytical geometry, Leibniz with the infinitesimal calculus, the empiricists such as Locke and Hume with their studies of psychology, Kant with Newtonian Science and its generalization, Hegel and Marx with history and sociology, and Husserl with Frege's logistic.

Besides this there were systems that stated there is no connection with science. And these systems therefore did not succeed in producing an original epistemology and have stressed the defense and interpretation of values in the form of transcendental theology like that of Plotinus, a rigorously immanent one as of Spinoza, or a radical idealism as in the German post-Kantians.

Piaget stated that "starting from the epistemological point of view, which is that in which philosophy comes closest to knowledge in the strict sense, it is of some interest to

[55] Jean, Piaget, *'Insights and Illusions of Philosophy'* ,(trans. Wolfe, Mays), Routledge and Kegan Paul, London, 1972, PP. 44-45

note that the great philosophical systems owe to the kind of science which has given them their epistemological orientation, not only the emphasis put on this epistemology but also the particular kinds of epistemology that they have adopted, which is more instructive"[56] . In this respect Piaget distinguishes different kinds of epistemologies.

First there is *Platonic Realism*, which projects the structure of knowledge into a suprasensible world without their depending on either a human or transcendental subject. The subject is not active in knowledge and is limited by reminiscence or participation, to the reflection of the eternal ideas. The latter, forms the basis for the supreme values such as moral, aesthetic and religious. This realism of transcendent ideas was the only epistemology compatible with the peculiar status of Greek mathematics. Although it had rational and operational character from the time of Pythagoras, it has put all the stress in virtue of the known psychological laws, on the result of these operations and not on their functioning, for conscious realization starts from the peripheral result of actions before turning to their inner mechanism, which, moreover, it never completely attains. The Platonic 'forms' do not require active relationship or interaction between environment and human being. Knowing implies 'making a copy of reality'. Piaget asserts that "knowing means 'reacting to reality and transforming it in such a way as to include it functionally in the transformation systems with which these acts are linked"[57]. Plato's genius consisted in separating out the epistemology implicit in this general situation. We see that, if the pre-Socratic concerned themselves with activities that could

[56] Ibid.....P. 47.
[57] Cf., Betty A. Sichel, "Plato's divided line and Piaget: A Response to Kieran Egan", *Curriculum Inquiry*, Vol.12, no.3, Autumn, 1982., PP.317-326.

be described as scientific or pre-scientific as well as philosophical. Thus, the first great philosophies of western civilization originated from reflection upon an already constituted science.

Aristotle found both logic and biology. He put forth, forms that recall the platonic forms or ideas, but in one case, embodied in the subject's discourse and in the other in the structure of the organism. Aristotle accepted the same systematic and static realism, like that of Plato and whole Greek thought, while introducing the forms into physical or spatio-temporal reality according to a second kind of epistemology, which we might call as 'immanent realism'. Greek thought, has always remained alien to the concept of an active 'epistemological subject', and the two powers that Aristotle attributed to the subject are those of a conscious realization of forms and an abstraction starting from perceptions enabling a content to be given to the forms. Sophists, for instance, have stressed the need for certain norms of subjectivity, but their aim seemed to be critical as they did not arrive at the 'epistemological subject'. Similarly the theory of forms in Aristotle, instead of being directed towards a dialectical constructivism ended therefore in a static hierarchy; the higher stages explained the lower ones who's built-in finality and the concept of passage from potentiality to actuality excluded any epistemology of the subject activity. Piaget stated "it is nevertheless true that this famous doctrine draws upon two kinds of inspiration, which form the starting point of two of the most important sciences of today: logic and biology".[58]

[58] Cf. Jean, Piaget, *Insights and Illusions of Philosophy*, (trans. Wolfe, Mays), Routledge and Kegan Paul, London, 1972, P.. 48

Descartes' discovery of epistemological subject would be inexplicable without three mathematical and physical innovations. This forced him to revise Aristotle's epistemology and to rethink the conditions of knowledge. First, the development of algebra brought to the fore the possibility of a discipline based on the subject operation and on their arbitrary combination, and no longer on geometrical figures experienced as external or no numbers considered as existing independently of the operations that engendered them. Second, discovery of analytical geometry showed him the possibility of an exact correspondence between algebra, the domain of thought operations and geometry, the domain of extension, from which arises the permanent Cartesian theme of the relation between thought and extension, which are at one and the same time in dissociable and basically distinct. Third, Galileo' discoveries concerning inertial motion, his fundamental method consisting in taking time, henceforth uni-directional, as an independent variable; and in a general fashion, the possibility of applying computational methods to physical transformation, are innovations having considerable significance. All these explain at one and the same time the Cartesian conception of causality as the logical mathematical reasons for the transformations, the rejection of finality and the rejection of the idea of force, because Aristotle thought of it as a substantial and non-transitive property of the physical body. If under the influence of the three above innovations, Descartes discovers the epistemological subject and its powers of radically assimilating physical reality, he remains in a position intermediary between his absence of a subject in Plato and Aristotle and the structuring subject of Kantian apriorism.

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Leibniz's like that of Descartes was, well known and directly influenced by his scientific discoveries. He derived the principle of continuity and indiscernible from the infinitesimal calculus, and its application that led him to the philosophical use which he made of the principle of sufficient reason. Proceeding from the algebra of the finite to that of the infinite, which is his new calculus, he grasped better than anyone else the dynamic operational character of intelligence. Locke's empiricism could not explain the *ispe* intellectus. But convinced of the unrestricted extension of the physical application made possible by his calculus, he did not accept an idealism, which he might have done if he had only concerned himself with the new powers that he discovered in the activities of the epistemological subject. Leibnitz's pre-established harmony or "perfect parallelism" simultaneously took account of experimental knowledge, of the relation between mind and body, and of the intuitive residues discovered even in the most abstract ideas.

While the construction of new logico-mathematical structures led Descartes and Leibnitz to the discovery of the epistemological subject, psychological consideration gave rise in Great Britain to a fourth kind of epistemological interpretation, that was seen in *Locke's Empiricism*, than Hume's. The position, characteristic of innatism and the hypothesis of pre-established harmony is, in fact, an unstable one. It assumes that either the subject in general is only the reflection or the locus of structures which exist independently of itself, and there is no epistemological subject or that there is an epistemological subject and it plays an active role in knowledge, in the form of a structuring, which it imposes apriori, on all experience or under the forms of progressive construction conserving the internal necessity characteristic of the apriori, but under a

dynamic and no longer static form. To adhere to innate ideas is to limit this construction, either a priori or dialectically, in favor of a kind of pre-formation or pre-determination which remains halfway between the initial realism and later achievements. Due to this, empiricism has questioned the hypothesis of innateness, using quite new arguments whose late historical development showed that they formed the starting point of an independent science: psychology founded on methodological observation and experiment. Locke wanted to start from the facts and was not interested in resolving questions by metaphysical deduction, and Hume attempted to introduce the experimental method of reasoning into moral subjects. Empiricists had the great merit of looking for verification in the facts, stating the problem in a way glimpsed by Aristotle, but which was new in its generality and its absence from all pre-suppositions. How are ideas formed in reality that is as they appear to observation and experiment? Empiricists proceed themselves by an empirical method, they have only observed in the factors constitutive of the origin of ideas the part played by experience with, in addition, an organizing factor that Locke referred to by the global phrase "operations of our minds" known by reflection, and Hume reduced it to the association of ideas.

Kant originated another type of epistemological interpretation: that of a-priori construction. According to Kant, it replaced the epistemological subject by knowledge conceived of as being a copy of reality. The most important scientific event of which Kantianism tried to give a general interpretation was anything but a simple copy: the impressive success of the Newtonian doctrine of gravitation and its extension to a varied range of phenomena was striking evidence of an agreement between logico mathematical

deduction and experience. It was therefore, the two fold proof, on the one hand, that the epistemological subject exists and its construction form the very stuff of the understanding. On the other, experience is structured and even capable of being structured indefinitely, and does not consist in the simple additive collection of recorded facts that satisfied empiricism in its interpretation. It is therefore, a question of elaborating a concept of the epistemological subject, satisfying the two fold function of indefinite constructability and of structuring experience whatever it may be.

The question whether philosophy has the status of 'wisdom' or a form of 'knowledge' is not an unnecessary or simple theoretical problem. Piaget considers this as a vital question, as it affects the success or failure of many.

As soon as he was introduced to this subject, like many children, got fascinated by natural history, and at the age of 11 years, had the good fortune to become the 'famulus'. This was the phrase the old zoologist, Paul Godot, used for Piaget, who then directed the museum, at Neufchatel solely on his own resources. He introduced Piaget to malacology and gave a number of shells of land and freshwater mollusks with the help of that Piaget made a collection at home.

It is in this context that Piaget discovered philosophy. But having, a father who was a historian did not help Piaget much, that's because his own father did not believe in historical knowledge. It was Piaget's godfather, who took a lot of interest in him. He was alarmed by exclusive specialization of Piaget and one summer, he invited Piaget to stay at his own house. There he explained to Piaget, 'Bergson's Evolution Creatrice'. This was a tremendous experience for Piaget and for two equally strong reasons, both of

which merged with those basic interests that impel adolescents toward philosophy. The first reason was cognitive. It was to find the answer to the great problems met during Piaget's intellectual development. Deeply interested in biology, understanding nothing of mathematics, physics, nor of the logical reasoning Piaget, was fascinated by the dualism of the *élan vital* and of matter falling back on itself, or by that of the intuition of duration and of intelligence unable to understand life because its logical and mathematical structures and oriented in the direction of inert matter. Piaget thus discovered philosophy answering exactly to his intellectual interests.

This made him devote his life to philosophy, whose central aim was to reconcile between sciences on the one hand and religious values on the other. Arnold Reymond his own teacher influenced Piaget, in two opposing directions. On the one hand, he got Piaget to appreciate rational values and on the other hand, he influenced Piaget indirectly and gradually making him doubt the value of the profession of philosophy. This was the same person who criticized the work of Bergson, which at first made Piaget to object to his essentially mathematical approach. Arnold Reymond was also a philosopher by inclination and he remained for Piaget the fullest and most admirable example of a thinker. With the help of Arnold Reymond, Piaget made progress in epistemology. After study on the epistemology of biology as science, he began to contemplate, in keeping with his former interests, a more long winded work on the theory of knowledge. All this Piaget looked at from a biological standpoint in other words, a study similar to that of Spencer, but without its empiricist perspective and in line with present knowledge in epistemology and biology.

Piaget arrived at two central ideas: (1) "was that every organism has a permanent structure, which can be modified under the influence of the environment but is never destroyed as a structured whole; all knowledge is always assimilation of a datum external to the subject's structure. (2) that the normative factors of thought correspond biologically to a necessity of equilibrium by self regulation: thus logic would in the subject correspond to a process of equilibrium"[59].

Piaget felt that in order to analyze the relation between knowledge and organic life, it would be useful to study experimental psychology. This was possible because Piaget had the extraordinary luck to work in a laboratory of a school, where he was given a free hand and entrusted with study aiming in principle to restandardize intelligence tests. This in fact allowed Piaget to analyze the different levels of the logic of classes and relations in child's thought. Piaget's studies on the logic of children were given a friendly reception by L. Brunschvicg and A. Lalande. Arnold Reymond regarded them as a kind of extension or parallel of the historico-critical method applied, as l. Brunschvicg said, to the "ages of intelligence" instead of to history. All this Piaget said, in order to show that he did not begin his career with unfavorable prejudice towards philosophy. Piaget states that "true in 1929, I rejoined a faculty of science and taught, in Geneva, at first the history of scientific thought then experimental psychology. But I did this without dogmatic prejudice and simply in order to find a more extensive field of experience"[60]. He analyses three important reasons, for his dissatisfaction with

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[59] Jean, Piaget, *Insights and Illusions of Philosophy,* (trans. Wolfe, Mays), Routledge and Kegan Paul, London, 1972, P.. 8.

[60] Cf., Gruber and Voneche, *The Essential Piaget,* Routledge and Kegan Paul, 1972.

traditional philosophy. The first reason for growing dissatisfaction with traditional methods of philosophy was caused by the conflict that he felt within himself. It was between the habits of verification of the biologist and psychologist, and speculative reflection, which constantly tempted him, but which could not possibly be submitted to verification. Speculative reflection is fertile and has been a necessary heuristic introduction to all inquiry. It can only lead to the elaboration of hypothesis, as sweeping one like, to be sure, but as long as one does not seek for verification by a group of facts established experimentally or by a deduction conforming to an exact algorithm, the criterion of truth can only remain subjective, in the manner of an intuitive satisfaction, of 'self-evidence,' etc. When it is a question of metaphysical problem that involves the coordination of values, only speculative reflection remains the only method possible; but remaining bound up with the whole personality of the thinker. It can only lead to a wisdom or rational faith and is not knowledge from the point of view of objective or interindividual criteria of truth. When it is a question, on the other hand, of the more delimited or de-limitable problems of epistemology, then an appeal to facts or to logico-mathematical deduction becomes possible: the historico-critical method, psychogenetic analysis of the formation of concepts and operations, the logical analysis of the foundations of mathematics, provide methods of testing that individual reflection is unable to provide. The second reason Piaget gives for the dissatisfaction is with regard to the pure philosophers. It refers to something which from the psycho-sociological point of view is very significant: this is the surprising dependence of philosophical ideas in relation to social or even political change. The third reason for dissatisfaction is the same

reason that made Piaget to become a professional psychologist, albeit one with interests centered on problems of epistemology, rather than a philosopher temporally occupied with psychological verifications before going on to outline a genetic epistemology. This reason has been the reaction to a number of philosophers whose interpretations gave Piaget the impression that we no longer speak the same language. This is not because they (philosophers) were critical, but because it seemed to Piaget to indicate an attempt having little validity on the part of philosophical judgment to meddle in the field of scientific research. Piaget rejected being called a positivist. Positivism for him "is specifically a doctrine intended to limit science, to assign definite boundaries to it, while for non-positivist scientists, science, is indefinitely open and can inquire into any problem, provided a method can be found about which scientists agree"[61]

By 1929, Piaget returned to Geneva as part of the faculty of science. He felt freed from philosophy and was even more determined to study epistemological structures using the historico critical approach, and above all the psycho-genetic one. Piaget began to study the operational structures in mental development (with his colleague B .Inhelder) and produced a kind of logical formalization applicable to the collected facts. He conducted a series of research experiments on perceptual development that completed his work on the psychology of the child.

Piaget relates and greatly values his experiences as former philosopher. These experiences enabled him to undertake the task of formulating a scientific epistemology that he always dreamed of. According to Piaget, one needs to remember that the

[61] Jean, Piaget, *Insights and Illusions of Philosophy,* (trans. Wolfe, Mays), Routledge and Kegan Paul, London, 1972, P. 17.

boundary between philosophy and science is always changing because it does not depend on the problems themselves. Neither of the two can ever be said to be definitely scientific or metaphysical. It is only on the possible delimitation and the selection of methods that enable us to deal with these circumscribed questions in relying on experimentation, on logic-mathematical formalization or both. He therefore, dreamed of "*genetic epistemology*" which would delimit the problem of knowledge in dealing with the question 'how does knowledge grow?' which concerns both its formation and historical development. Though Piaget is considered as one of the most significant child developmental psychologists he always called his position "genetic epistemology".

The reasons why Piaget is called a child psychologist is mainly because he has studied scores of children engaged in games such as marbles and pouring water into glasses of different sizes. Piaget's observations made him think as to why children act as they do and what they are capable of learning. Thus Piaget was only trying to understand some of the philosophical views about knowledge. Therefore, we would be mistaken if we picture Piaget as a child psychologist. To understand his genetic epistemology we need to understand why he was concerned with the construction of such an epistemology. By means of his epistemology he wanted to show the conditions in which knowledge occurs. He was certain that one could arrive at 'knowledge' if one were to approach it scientifically as most biologists would. Thus, in order to find a bridge between biology and theory of knowledge, it was necessary to study mental development, the development of intelligence and the genesis of ideas. To study epistemology objectively and scientifically we must not take knowledge with capital K, as a state in its higher forms,

but seek the processes of information: how one passes from a lesser degree of knowledge to a greater one; relative to the level and point of view of the subject. Piaget calls "the study of such transformation of knowledge, the progressive adjustment of knowledge.....genetic epistemology"[62].

Before we proceed further, it is important to note the distinction that Piaget noted between Genetic Epistemology, Genetic Psychology and Child Psychology. Beginning with "child psychology it is the study of the child himself or herself. Whereas genetic psychology seeks within the study of the child the solutions to general problems, such as those of the mechanisms of intelligence, perception, etc., for it is only in analyzing the formation of such mechanisms that one can provide their causal explanation. Genetic epistemology is the formation of knowledge itself. It deals with the cognitive relation between the subject and the object. Not only that it bridges the gap between genetic psychology and epistemology in general, which in turn helps to enrich development"[63].

Though epistemology contains genetic psychological pre-supposition, it is more than genetic psychology. Apart from factual pre-suppositions and questions, it also involves normative and logical consideration. There cannot be a cognitive psychology without priori epistemological analysis. If one restricts oneself to a static psychology like that of an adult, one may find it easy to draw a line of demarcation between psychology and epistemology. But if we are to explain behavior and mental mechanisms by their development, we find we are forced to decide what in this formation depends on the

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[62] Jean Claude Bringuier, *Conversations with Piaget,* Cambridge University Press, 1980, P. 7.

[63] Cf., Jean Piaget, *From Genetic Psychology to Epistemology,* In psychology and Epistemology(trans. A. Rosin)., New York, PP. 23-44.

objects, on the activities of the subject, or and the nature of the form between the two. Here, therefore we are forced with epistemological problems, whether we like it or not. In other words it is compulsion for anyone to understand the problem as Piaget saw it. What was the available solution according to him? What made him construct such a theory?

Although one cannot give a detailed answer of these questions, one can briefly describe, some of the prominent features. These prominent features will help us to understand the various intellectual currents of thoughts that flowed. These constitute the basis of Piaget's thought. The discussion is of 19th century origin and such thoughts are not shared by the 20th century thinkers. These include evolutionary biology, rationalism, pragmatism and functionalism, the historico-critical philosophy of science, and holism versus atomism.

Evolutionary biology: The late 19th century is characterized by a historical or the evolutionary outlook. This outlook was adopted by the intellectual figures of the century such as G.W.F. Hegel, Karl Marx, August Comte and Henry Bergson. This outlook reached its scientific culmination in the evolutionary biology of Jean Baptiste Lamarck, Charles Darwin, Alfred Russell Wallace and T.H. Huxley. This evolutionary biology, genetics and developmental biology has always influenced Piaget's thinking especially conceptual and theoretical problems in theoretical biology. Piaget is also concerned with issues such as vitalism, mechanism, teleology and chance. The common belief that evolutionary theorist have is that life is a process that evolves. This influenced Piaget's mind. Secondly, all the evolutionary thinkers believed in the stages of development that

proceeds according to relatively fixed laws. Evolution seems to proceed in a specific direction towards a greater equilibrium, adaptation, freedom to the classless society and so on. This directional evolutionary process was considered to be an instance of progress. A theory or philosophy developed to answer questions in one particular context, for example, in biology could be applied to the other area like that of embryology or the history of ideas. As Kitchener points out "all reality biological, physical, psychological, sociological, intellectual is evolving in the direction of progress. This evolutionary direction tends towards increasing equilibrium and this process of equilibration is not due to accident or chance but rather is subject to the same underlying law or explanatory principle wherever it is found"[64]. Piaget's theory of evolution is an alternative to neo-Darwinism and vitalism. Piaget is a naturalist in the same sense like that of Aristotle or John Dewey. He is not a materialist or reductionist. Piaget's naturalism is a kind of rationalism---a biological and naturalistic rationalism and not a Cartesian or platonic one. Piaget has always been committed to a biological (especially evolutionary) epistemology. For Piaget, to give a biological explanation of knowledge is central to explaining knowledge. One should not understand this as reduction of epistemology to biology. On the contrary, Piaget believes that biological processes have a rationality of their own.

Rationalism: For Piaget reason is not fixed; rather it evolves. Reason he says cannot explain what happens by chance nor by means of causality. Reason is something that evolves rationally. How can this be explained in terms of evolutionary perspective?

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[64] Richard, F Kitchener, *Piaget Theory of Knowledge Genetic Epistemology and Scientific Reason,* Yale University Press, London,1986, P. 6.

Piaget claims that "our knowledge of the physical world presupposes apriori logico-mathematical structure into which sensory information is assimilated"[65]. Piaget explains the development of logic-mathematical knowledge in terms of changing relationship between organism and environment. According to this model, development is characterized as a process of increasing equilibrium between organism and environment. In such a process, partial equilibrium gives way to more complete equilibrium that can be characterized as a shift from organic causality to rational necessity. If reason is understood in terms of increasing equilibrium between organism and environment then we are forced to interpret the nature of reason and logic quite differently from traditional thinkers. In which case, the reason in the latter tradition becomes theoretical and contemplative. It becomes a kind of requirement for organism for the adaptation. Rationality thus consists in coping with one's environment and satisfying one's need just as much as it consists in constructing a logical proof.

Functionalism and Pragmatism: These are basic epistemological issues and the basic unit of epistemic analysis. It explains how organism adapts to a changing environment. Epistemic items such as ideas, beliefs and theories are to be evaluated in terms of how they function in the actual environment to facilitate successful goal attainment and adaptation. Piaget's model of equilibrium is similar to John Dewey's pragmatism. If an organism is adapted to its environment and all its needs are satisfied, intelligence and inquiry would never be needed. Only when there is some initial need, mental life, intelligence, and conscious awareness begins. Intelligent activities consist in constructing

[65] Cf., Jean Piaget, *The Principles of Genetic Epistemology,* Routledge and Kegan Paul, 1972.

and testing hypothesis about solutions to problems. If a hypothesis is successful, then the organism is once more adapted and equilibrium is restored. Progress is located in the increasing adequacy of the hypothesis for solving actual problems and anticipating possible ones. Although Piaget's concept of equilibrium is inspired by functionalism, he shares it with Charles Pierce's and Dewey's pragmatism.

Historic-critical philosophy of science: This conception of knowledge is taken by Piaget from a group of French thinkers. Richard Kitchener mentions few such as Jerome Lalande, Gary S. Mayerson and others. They belonged to heterogeneous movement known as 'historico-critical philosophy of science'. Although, it is difficult to characterize, the essential features of the movement, one can say that they were all concerned with a critical analysis of science and the basic concepts underlying scientific knowledge. All these thinkers in some way or the other were influenced by Kant's attempt to construct a critique of reason. In the late 19th century, Kant's original twelve categories were jettisoned by the influential neo-Kantians. These were replaced by concepts which were more basic to science. Kant always gave an a priori, transcendental deduction (justification) of his particular categories of thought; but these philosophers believed that one had to look to the historical development of reason to determine its nature and function and to discover what if anything was necessary. There can be no apriori transcendental deduction of the categories of thought, for, these concepts change over the course of time and may be expected to change in the future. The influence of this school on Piaget cannot be over estimated as Piaget always stressed its importance. Piaget sees himself as belonging to this tradition and even claims that genetic

epistemology constitutes a simple extension of the historico-critical method that is its extension to the individual level. This school was also convinced that reason evolves rationally. A crucial part of Piaget's program is to carry out the historico critical program at the level of the individual.

Holism and individualism: These concepts apply not only to the social realm but also extend beyond it. This is purely a debate about the ontological nature of social wholes but in view of Piaget it has implications in other areas. Although both the alternatives that is, holism and individualism are inadequate Piaget puts forth another alternative namely *relationism.* Where Piaget states that "a whole is not reducible to the sum of the individual parts but neither does the whole have properties not possessed by the members. The whole is equivalent to the parts plus all of their relations"[66].

The social whole according to Piaget is the addition of all the relations between the individual members, a point neither position adequately recognized. Thus Piaget says, if we know all the interactions between the individuals, we would have so-called composition laws, which would allow us to explain the social whole. This relationism, and is central feature of Piaget's social psychology, his structuralism and his genetic epistemology in general. Society is to be explained to Piaget in terms of the relations between individual's relations of constraints, cooperation, social ideas and so on. It is not restricted to non-relational properties of individuals. In short, Piaget is claiming that individual psychology is inadequate to account for the sociological dimension but that social psychology can accomplish such a task.

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[66] Richard F Kitchener, *Piaget Theory of Knowledge Genetic Epistemology and Scientific Reason*, Yale University Press, London, 1986, P. 14.

If one understands the above mentioned intellectual views about Piaget, then the task of genetic epistemology becomes apparent. It would study the development of knowledge. Given that knowledge has increased from a lesser state to a more adequate one. But how could one describe and explain this epistemic transition? One, can show that Piaget's theory of equilibration becomes central to epistemic dynamics, and it provide basis for explaining epistemic transformations. Further Piaget's structuralism, led him to conceptualize epistemic states as holistic structures. An epistemic structure therefore consists of an epistemic stage interpreted in Kantian type of structure in which epistemic categories are crucial. Thus in short, genetic epistemology attempts to study the developmental transition from one epistemic stage to the next.

Such an epistemology would stress the essential need for empirical questions to be answered by empirical means, because it stresses the empirical (scientific) dimension. Piaget's genetic epistemology crucially depends on scientific information which was not readily available. Piaget took upon himself the task of doing the necessary empirical research that would answer the above questions. Genetic epistemology and Piaget's own theory of cognitive development are so intertwined that one cannot be understood without the other. Although the main focus is on genetic epistemology, it becomes necessary to have a preliminary over view on his theory of cognitive development.

Piaget is widely known for his cognitive development theory. This is the theory that emphasizes epistemological psychological cognition in the individual. This theory is often taken to be a pure psychological theory about child development, a scientific theory of psychological development that makes factual claims about what happens in the

course of development, claims backed to some degree of scientific evidence. According to Piaget "this process of development proceeds in terms of series of stages, each of which has an underlying cognitive logical structure"[67]. What does Piaget mean by stages in his theory?

Piaget speaks of qualitative changes in the underlying processes themselves as a fundamental fact of mental growth. These qualitative changes are grouped into a succession of four global stages, which could be also called as "periods". There are certain key properties of the stage concept itself.

The first important feature is that Piaget believes his stages are real and not arbitrary. They are real in the sense that they are comprises of natural groupings of cognitive contents that occur at specified points during development. Piaget's assumptions that his stages are real and natural entities, itself makes his theory apart from other approaches to cognitive development.

In its most general sense, Piaget's stage concept is a means of grouping together qualitative changes in schemes. Scheme changes come in two varieties namely: 1) broadening a given scheme to include a wider range of situations. 2) Differentiation of new scheme from the old ones. When the second type of scheme change occurs, the child passes from one stage of cognitive functioning into the next higher stage. Piaget's stages of cognitive development are totally dependent on his ideas of scheme and scheme changes. Thus to say that a child is at a particular stage of cognitive development is to say that a certain set of sensory-motor or cognitive structures are present, and to say that

[67] Hans, G. Furth, *Piaget and Knowledge- THEORETICAL FOUNDATIONS,*, Prentice Hall, Inc, New Jersey, 1982,PP. 28-29.

a child has entered a new stage of cognitive development is to say that qualitative changes in sensory-motor or cognitive structures have occurred. According to Piaget, stage must satisfy a certain set of criteria. The exact number of criteria given is three and five. But the most important ones seem to be four.

1. Qualitative changes in cognitive contents.
2. A culturally universal invariant sequence in the overall progression of stages.
3. Inclusion of the cognitive structures so each preceding stage is in the next subsequent stage.
4. An overall integration of the structures of each stage.

Requirement (a) is Piaget's way of assuming that each stage will have qualitatively different cognitive structures. Unless there are qualitative changes in overt behavior, there is no reason to infer qualitative changes in underlying organizations. This requirement may be illustrated by an apparently qualitative behavioral change which takes place during infancy. There are improvements in grasping and looking behavior during infancy. Another change that occurs is that the two behaviors become tightly coordinated. In addition to the separate incremental improvements in looking and grasping, the behavior eventually become sub-ordinate to a single system that psychologist sometimes call the 'eye-hand' schemes. Another example may be the concept of transitivity that provides another case of qualitative looking changes in cognitive content.

Requirement (b) -- according to stage requirement (b) every child passes through Piaget's stages in exactly the same order. The first stage succeeds the second stage invariably, not

just on the average. The same things holds true for the relationship between the second stage and the third stage and the third stage and the fourth stage. The invariant sequence of Piaget's stages is referred to as their natural acquisition order. According to Piaget, there must be an invariant order in the emergence of his stages for the good and sufficient reason that the underlying structures of preceding stages are always incorporated by the structures of the subsequent stages. This sort of invariant progression that Piaget is talking about is called a logically guaranteed progression.

Stage requirement (c) is the hierarchization of requirement, and is closely related to the invariant sequence requirement. The hierarchization requirement is one way of insuring an invariant progression of stages. The central idea expressed by requirement (c) is that earlier and more primitive cognitive structures form the foundation on which more advanced levels of structures are built.

Stage requirement (d) maintains that the various structures that characterize a given stage must be consolidated into a uniform while before a new stage is declared. Requirement (d) follows the first three both logically and developmentally. (a), (b) and (c) requirements are necessary condition for the stage whereas (d) is only a sufficient condition.

According to Piaget, there are definite stages of cognitive development which are also called as "epistemic stages". Epistemic stages consist of a set of epistemic concepts related to each other in a logical way. These concepts include sensory-motor schemes operations, real categories(space, time, causation and object permanence), formal categories (classification, number and quantity) , perceptions, concepts, semiotic

categories(ideas, images, symbols, and signs), moral, emotional and social categories and so on. With the help of these epistemic elements, we can know the world and the means by which the world is assimilated and we can take on a variety of structural forms and organizations. Each structure represents a kind of logic, a set of formal and quasi-formal relationship. According to Piaget, a structure has three properties, that is, it is a whole, it consists of law and transformations and it is self-regulating.

According to Piaget, cognitive development proceeds by means of four basic stages:

1. The sensory- motor stage that is from 0-2 years.
2. The pre-concrete operational or intuitive stage that is from 2-7 years
3. The concrete operational stage from 7-12 years
4. The formal operational stage from 12 -15 years.

The sensory motor scheme that is from 0-2 years. Piaget begins his analysis of the development of intelligence with a detailed study of the changes that occur in the baby's understanding of the world around him during the first two years of life. According to Piaget, the child at birth has no awareness of self and of not self, of an individual set in an environment. The world for the baby is spaceless, timeless and objectless, an undifferentiated experience at present. The sensory motor system of the baby is very restricted as the baby at this stage can receive sensation arising from within his body and from the immediate surroundings to which he can make certain limited responses. At this stage, the baby shows limited innate behavior patterns grasping, sucking and gross body activity. When these reflex-like patterns interact with the environment, a modification and development of behavior occurs. For example the

tendency to suck any object can be exercised only when the object comes in contact with the lips. As soon as the baby learns to suck objects, through experience he/she comes to know which objects have suck-able properties and which ones do not have. By this, the child will know the difference sensations associated with sucking the nipple, the bottle, the thumb, or the corner of the pillow. Changes also occur in sensory motor functions. Vision is at first, a reflex response to light intensity, but the eyes begin to focus on specific objects and to follow them as they move. Grasping is at first a reflex response to an object placed against the hand, but the hand begins to search, grasp and release objects without the initial tactile stimulus. Gradually, these separate areas of reflex activity become coordinated. In summary, it can be seen that the internal needs of the baby are satisfied by the exercise of his reflex behavior patterns upon the environment in which he is placed. This is the first stage. Thus the first period of mental development that is the sensory motor period extends broadly from birth to the appearance of language. The sensory motor stage is called by Piaget as stage of 'egocentricism'. The child cannot distinguish the self from the world, because he or she does not yet have a sense of the world or the self. There exists at this stage a kind of pure neutral experience, and it is much later stage that the individual comes to differentiate and construct the self and object world as two co-relative poles of experience. The process of overcoming the egocentricism begins by means of the *'Copernican revolution'*, where the individual begins to become aware of him/her as one 'constructed 'object among others. This process of 'decentration' itself pre-supposes the development and construction of certain categories like object, permanence, space, time, causality and their elaboration into a

framework of reality. The child at this stage knows the world only externally that is by means of his or her actions on it. This is an epistemology of 'pure praxis'. Rationality at this stage is purely instrumental rationality. One possessing"logic of action"- a kind of primitive means 'end' rationality based on success instead of understanding. There are no internal ideas, no abstract thought, no conceptual thought and no full blown propositional logic.

The *second stage* is called pre-operational or intuitive thought that extends from 2-4 years to 4-7 years. Piaget calls this stage as a stage of 'semiotic' function. The crucial item of this stage is the development of the ability to represent or symbolize by means of imitation, play, signs and symbols. The child begins to symbolize and represent actions and thus to reason about them. Here Piaget gives the example that the child can use a mental picture of a bicycle or the word bicycle or a small schematic toy to stand for the real bicycle when it is not in immediate view. The ability to represent in this way makes it possible for the child to operate on new levels.

This stage enables the child to move towards the internal sphere of thought; still the child is egocentric in his or her representations. Intelligence of the child is practical and this alone helps the child to move to a more "thoughtful" intelligence. The child's thought at this stage is limited. The external sphere of motor behavior thus remains pre-logical. At this stage, the child interacts quite effectively with the immediate world of things and of people around him. He possesses schemes enabling him to manipulate objects and use them as means for the attainment of his goals. The infants also experiments with things to achieve a practical understanding of their properties. All these

abilities are less concrete and are always limited to immediately present objects. For example, the infant may be able to use a stick to bring an object within reach. He cannot conceive of relationship between objects that are not within his immediate scope of vision. At this stage, the infant is able to act only on things which are perceived directly. The child begins to develop novel cognitive or mental processes.

Semiotic function also allows the evocation of the past. It manifests itself in several ways, wherein the child begins to employ mental symbols to engage in symbolic play and to use words. With regard to the nature of the mental symbol, it is difficult to answer this question. There is no method which permits a direct look at the child's thought. Partially, one can understand it in terms of child's visual images. Although sometimes, a person may use visual imagery, he may at other times represent objects, by their sounds or even by an abbreviated form of their movements. There could be two possible answers. One is the ability to symbolize. This is an entirely new function which suddenly makes it appearance when the child is about two years of age. Secondly, another possibility is that symbolism has pre-cursors in the sensory motor period. Emphasizing continuity in intellectual development, Piaget adopts the second alternative. He holds the view that the semiotic is derived from imitation. Piaget argues that such imitation of things is the sensory-motor forerunner of mental symbolism. Another crucial point is meaning, it means the process by which the child acquires meaning. Take for example, what does bicycle designate? Our response to this question is to say that both the mental symbol and the word obviously refer to the real bicycle. But for Piaget, this is complicated. This is because, the signified is what the symbol or the word stands for or

its meaning is not the real object. But rather the child's understanding or intellectual construction of the real object. To put it in different words, meaning does not refer to things, but instead stands for one's knowledge of things. For example, one child may think that bicycle is something that goes delightfully fast as well as it is one kind of vehicle. For another child, the signified may be somewhat different, that is having fallen often from bicycles, and he may feel that they are frightening and dangerous. Further, he has no conception of the bicycle as a vehicle. But one should note here that for both these children the word bicycle evokes some common meaning that is it is having two wheels, handle bars and so on. Both the child can easily identify what bicycle is and what it is not. In denotative sense, the word does refer to the real object, but at the same time disagreement arises between the two children regarding the meaning of words that is for one, a bicycle is delightful and for the other, it s frightening.

In Piaget's terms, each child has assimilated the word "bicycle" into a different set of schemes (the signified or the meaning). Therefore, the word bicycle, or the children's personal mental symbols for it, does not refer to the real things, but to their understanding of it. To summarize, internal imitation (accommodation) provides the child with symbols. The child then endows these symbols and words too with meanings.

Another aspect about the semiotic function is how the child uses language and gives its meaning. The meaning of the words is not constant for a young child. In fact, for him, words have little socially agreed upon meaning, instead they are quite personal and they resemble idiosyncratic mental symbols. The development of language also involves the use of words in a representational way. At about 2 years of age, the child

generally begins to use words to stand for absent things or events. This use of words of a child is similar to the adult use of words.

One can also see some types of reasoning at this stage. The child shows three different kinds of reasoning. The first type of reasoning is where the child is faced with a simple situation which has been experienced before. The child "reasons" about the situations very concretely in terms of what had occurred in the past. For Piaget "this type of reasoning is simply an application of previous experience to a current situation and this not to be confused with the genuinely deductive reasoning of mature persons"[68]. The second type of reasoning is where the child's desires distort thinking. At this stage, the child attempts to reason to achieve some goal, but thought distorts reality in accordance with desires. This is similar to Freud's notion of wish fulfillment. The third type of reasoning is what Piaget calls trans-deductive. Piaget states that "the young child's reasoning lies in between induction and deduction. The child does not go from the general to the particular or from the particular to the general, but rather from the particular to the particular without touching the general"[69]. Transcendental reasoning sees a relationship between two or more concrete (particular) terms when there is none.

When the child reaches the age of five to six years, there is continuity of development of sensory motor schemes that are applicable to a wide range of objects, here is improvement in the skills of language. The child tries to acquire mental representation for increasing large portions of the surrounding world. The child's development extends into a number of new areas. This second sub stage is marked by the

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[68] Cf., Jean Piaget; *The Principles of Genetic Epistemology*, Routledge and Kegan Paul, 1972.
[69] Cf., ...ibid

beginning of decentring and the discovery of certain objective relationship by means of what we call constituent functions. One can also note a striking similarity in relations holding between the second phase of pre-operational representative intelligence and the first and the second and the first phase of sensory motor intelligence. In both cases we have a transition from radical ego-centricism to relative de-centring by objectification and spatialization.

Apart from the similarity there is a point of difference that is at the sensory motor level, the initial centering is connected with the body itself, with the subject being aware of this, whereas with conceptualization from the level of two to four years there is simple assimilation. There is simple assimilation of objects and their powers to the subjective characteristics of actions itself. What the individual has already acquired on the sensory motor level is now constructed on a new plane.

A child of five to six years can be relied upon to know that if he pushes an upright rectangular plane at its centre, say with a pencil, it will move in a straight line, but if one its sides are pushed 'it turns'; or that id he is shown a piece of thread placed to form a right angle(I_) he will be able to predict that pulling one of its ends will make the length of one of its segments increase and shorten that of the other. Thus in such cases, pre-relation becomes true relations by reason of their co ordinations.

This stage could be concluded by noting chief important features that is with that of logic and of causality. Beginning with logic, one can note that coordination between conceptualized actions have resulted in an important advance that is that the child now invariably differentiates between individual and class. Collection is no longer figural but

consists of small groups of elements without spatial configurations. Quantification of "all" and "some" is still far from being achieved, for the understanding of A<B for example involves the reversibility A=B- A and the conservation of the whole B. Once the part A is subtracted from its complimentary A. Lacking reversibility and lacking even these very elementary methods of quantification, there is yet no conservation of collection or material quantities. This is proved on the basis of the many studies carried out in several countries and the experiments in this connection have also confirmed the existence of these non-conservation characteristic of the pre-operational levels.

Turning to the notion of causality, and specifically to the process of transmission through intermediaries we also encounter the same lack of notion of transitivity. For example a number of marbles are placed in a row, the first is struck by another marble and the one moves off alone. Children at this level, do not understand, as they do at the following stage, that part of the impulse has passed through the intermediary marbles. Instead they imagine a succession of immediate transmissions as if each marbles pushed the following one in the way in which spatially separated marbles do.

The *third stage* is called "concrete operations" that begins from the age of 7 to eleven. This stage is highlighted by the beginning of true logical operations of symbolic thought. The thoughts that arose during the preceding period lacked certain logical properties; these finally attain equilibrium at this stage. Before, they did not constitute what Piaget calls an "operation". By operation Piaget means "an action which has been

internalized, made reversible and integrated into a larger holistic structure typically a group or grouping"[70].

Psychologically operations are actions which are internalizable, reversible and coordinated into systems characterized by laws which apply to the system as a whole. They are actions that are carried out on objects before being performed on symbols. They are internalizable since they can also be carried out in thought without losing their original character of actions. They are reversible as against simple actions which are irreversible. In this way, the operation of combining can be inverted immediately into the operations of dissociating whereas the act of writing from left to right cannot be inverted to one of writing from right to left without a new habit being acquired differing from the first. Since operations do not exist in isolation, they are connected in the form of structured wholes. The concept of reversibility is especially crucial. The logical operation at this stage result from the coordination of the actions of combining, dissociating, ordering and the setting up of correspondences which then acquire the form of reversible systems. Concrete operations belong to the logic of classes and relations but do not take into account the totality of possible transformation of classes and relations.

One of the most important operation system is that of classification or the inclusion of classes under each other for example sparrow (a) <birds (b) <animals(c) <living beings (d).

Another important operational system is that of seriation or the linking of a symmetrical transitive relations into a system. For example the child is given a certain

[70] Jean, Piaget, *The Principles of Genetic Epistemology,* Routledge and Kegan Paul, 1972, PP. 60-8

number of unequal rods say A, B, C, D .....to arrange in order of the increasing length. If the rods are marked unequal, there is no logical problem as he can conduct a series by relying on observation alone. But if the variations in length are small, so that the rods have to be compared two at a time before they can be arranged in such a series, the following is observed. Before the age of seven, on the average, the child proceeds unsystematically by comparing the pairs BD, AE, CG, etc and then corrects the results. From seven years onwards, the child uses a systematic method. He looks for the smallest of the element, then the smallest of those which are left over etc. And in this way easily constructs the series. This method pre-supposes the ability to coordinate two inverse relations that is E>D, B, A AND E<F, G, H, etc.

Other systems that appear during the same period having a multiplicative character are for example, the child can classify the same object taking account of two characteristics at time sequence (A1)and non-square(A1) and red(A2). In a similar fashion, the child acquires the capacity for multiplying relations using tables of different kinds, correspondences, etc. These different systems of logical operations are of special importance in the constitution of the concept of number, time and motion and in the construction of different geometrical relations. From seven to eight years, children become aware of the transitive character of equalities in the case of lengths, but only towards nine to ten years in the case of 'weight' and towards the age of 11-12 years of 'volume'.

Operational system at this level is restricted and fragmentary. With the aid of concrete operations, the individual can classify, order serially from equalities or set up

correspondences between objects, without operations being combined into s single structures whole. From the psychological point of view, this means that operations have not yet completely achieved equilibrium, and this will only occur in the following stages.

The *fourth* stage is the formal operation that proceeds from eleven to twelve years and reaches the equilibrium at about fourteen to fifteen years. According to Piaget, an individual reaches the peak of cognitive development at this stage. The feature of this stage is the ability to reason by hypothesis. Therefore, the child is able to reason about abstract, formal, and propositional objects. At this stage individual has a slightly different logical structure in which four types of operations can be performed. These are, inversion, negation, reciprocity and correlativity (INRC). These are called formal operations. They represent the kind of transformation that may be performed on hypothesis in order to delineate the possible relations between all of them.

The hypothetico- deductive reasoning is characterized interalia by the possibility of accepting any sort of data as purely hypothetical and reasoning correctly from them. For example, when the child has read out to him the following sentence from Ballard's nonsense sentence test: am glad I do not eat onions, for if I liked them, I would always be eating them and I hate eating unpleasant things". The subject at the concrete level criticizes the data that for instance,onions are not unpleasant, it is wrong not to like them, etc. Subjects at the present level accept the data without discussion, but also merely bring out the contradiction between 'I liked them and onions are unpleasant '. But it is not only on the verbal plane that the subject reason by hypothesis, this new capacity has also a profound effect on his behavior in the laboratory experiments. Subjects at this pre-

operational level enhance shown apparatus from the laboratory behave quite differently from those at the concrete level. For example, when they are given a pendulum and allowed to vary the length and amplitude of its oscillations its weights and initial impulse, subjects of eight to twelve years simply vary the factors in a haphazard way and classify order serially and set correspondence between the results obtained. Subjects of twelve to fifteen years endeavor after a few trials to formulate the entire possible hypothesis concerning the operative factors and hen arrange their experiments as a function of these factors.

Logic of the individual is with propositions as well as objects. A group of propositional operations such as implication P implies Q, disjunction PvQ, incompatibility P/Q are being constructed. This is connected with the appearance of a new group of operations or "schemata". The first of these operational schemata is combinational operation (combinations, permutations, aggregation). At this stage, the subject who is of may be twelve years or so is able to construct all the possible combinations in an experiment.

The second operational schema is that of proportions. On this, experimental findings have shown that subjects from eight to ten years are unable to discover the proportionalities involved. From eleven to twelve years onwards, the subject constructs a qualitative scheme of proportions which quickly leads him onto metrical proportions often without learning about these in school.

Another operational schema whose constructions can be profitable analyzed is that of mechanical equilibrium involving equality between action and reaction. This

period includes two important acquisitions. Firstly, the logic of proposition which is both a formal structure holding independently of content and a general structure. There is coordinating the various logical operations into a single system. Secondly, a series of operational schemata which have no apparent connection with each other or with the logic of proposition.

Piaget entire developmental process comprises of several important themes, these in turn could be considered not just psychological features, but also epistemological features too. This could be also understood as empirical properties of epistemological development.

a) *The law of decentration*: In the process of cognitive development, the individual becomes less egocentric in his or her epistemological outlooks. The individual further attains greater degrees of objectivity and rationality. According to Piaget, egocentricism is the failure to distinguish the self from other objects and persons. Piaget defines the term "egocentricism" as "on the one hand primacy of self satisfaction over objective recognition.....and on the other distortion of reality to satisfy the activity and point of view of the individual. In both cases, it is unconscious, being essentially the result of failure to distinguish between the subjective and the objective"[71].

According to Piaget, at the beginning of the mental evolution, there is no definite differentiation between the self and the external world that is impressions that are experienced and perceived are not attached to a personal consciousness sensed as a 'self' not to objects conceived as external to the self. Self and the objects exist in a dissociated

[71] Muriel Seltman and Peter Seltman, *Piaget's Logic: A Critique of Genetic Epistemology*, George Allen and Unwin, London, 1985, PP., 313-314.

block. They are spread out on the same plane which are neither internal nor external but widely between the two poles. These opposing poles gradually become differentiated. Thus, it follows that due to the lack of dissociations; everything that is perceived is centered on the subject's own activity. This failure is mainly due to the infant's experience which is neutral. His or her activity can be characterized as a set of relations or interactions. There is yet no subject or object with which to be interacted. The egocentricism of the child is unconscious since the child is aware only of his or her actions and their results, not of the self or the underlying cognitive mechanism which produce the action. It is only by means of friction with other minds, by means of exchange and opposition thought that it becomes conscious of its own aims and tendencies.

Egocentricism, is thus, replaced by objectivity and rationality; this is mainly due to the law of decentration. According to this principle, the individual then decanters him/her from a privileged frame of reference. This occurs by a process of construction. A more objective, external frame of reference is created in which the individual is situated merely as one object among many others in which all points of view are equally represented and none are special, in which relations between points of view become especially important. Such a process could be characterized as a transition from a naïve Phenomenalism to objectivity, reciprocity of point of view and relativity of framework. In other words, for Piaget, decentration refers to a "condition whereby the individual

ultimately achieves the capacity to see the other viewpoint or place himself in the other person's position"[72].

2) *From perception to thought*: This is another way of expressing virtually the same point about egocentricity. Initially the child trusts his or her naïve perception. These perceptions of the child are as immediate, non-critical perceptual appearance of things. . In the course of development, these naïve appearances are corrected by reason; it is only by reasoning about appearances and correcting them, that rational knowledge is possible. Piaget gives the following example "if the child were to trust naïve appearances, he or she would respond that a ball of clay transformed into a patty (or hot dog) has less (more) clay than the original ball"[73]. This judgment is based on the naïve appearances of things. The correct answer requires the child to reason about the underlying process and to allow 'reason to triumph over sense appearance'. Similarly, when a ball is hidden in a box and the box is removed, the child uses reason to determine that the ball has remained in the box during this process. Once again, naïve appearance that is where the ball last disappeared from view—must be suitably reinterpreted and corrected by reasoning. There is a transition from a kind of naïve empiricism to c critical rationalism, a transition from perception to thought.

3) Internalization of action: A third general characteristic of cognitive development can be called the principle of internalization. In the initial stages of development cognition is purely manifested in the form of external actions, such as, that of sensory

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[72] Cf., Jean Piaget, *The Moral Judgment of the Child,* Routledge and Kegan Paul, 1932.

[73] Richard Kitchener, *Piaget Theory of Knowledge Genetic Epistemology and Scientific reason,* Yale University Press, London, 1986, P. 22.

motor schemes such as sucking, grasping and pulling. Even the thoughts are exclusively external. The individual's mentality, therefore, is exclusively external and resides in observable actions. Gradually, these schemes are transformed into habits and intelligent behaviour, and the external actions become represented externally by imitation and play and internally by images. Sensori motor schemes thus give way to egocentric thinking involving 'pre-concepts' and these give rise to concepts. The key issue is that which allows external behaviour to be represented internally.

4) From irreversibility to reversibility: this stands in close relation to the above notion. It states that in the process of cognitive development there is a movement from irreversibility to reversibility. Perception is irreversible in nature but thought is reversible. Although we cannot reverse perceptual sequence, we can reverse sequences in thoughts which are multi-directional as well as temporal. Because thought, is reversible, necessity is possible, since necessity itself is a temporal. Necessity therefore, can only be lodged in thought and not in perception. This transformation from irreversibility to reversibility is related to the internalization of action and to the transition from perception to thought. This also pre-supposes the view that there lies a fundamental difference between gestalt structures and the logical structures of thought. This could be explained by giving the example, that in the course of development there is initially a predominance of rhythms, which gives way to regulations and then to grouping. Rhythms are non-reversible, regulations are semi-reversible and grouping is completely reversible. Such theme underlies and accounts for the progressive

developmental transformation of merely causal facts into rational norms and the transcendence of biological processes by psychological and sociological ones.

5. The *grasp of consciousness* (Claparede's law): According to this law, as long as one successfully meets one's needs and adapts to its environment, consciousness of the self or internal mental mechanism does not arise. Only when there is some frustration of needs for example an environmental obstacle or hindrance then we begin to become aware of ourselves and our internal mental life. We are aware only of environment objects and the results of our actions. The direction of consciousness is centripetal in the sense it proceeds from the external results of our mental activities to the internal mental mechanism themselves. This realm of internal mental mechanisms and structures resulting in action is the cognitive unconscious. For Piaget, introspection does not occur if actions are successful, it will not even be possible if one remains solely on plane actions. Becoming aware of internal structures requires a movement from the plane of actions to the plane of thought, a shift from a lower level to higher level, which Piaget calls "abstract reflective abstraction".

6. *The law of temporal displacement*: During the process of development, the individual passes through a series of cognitive structural stages. According to Piaget each stage is constructed by the individual himself, this construction involves reflective abstraction. The construction is not linear but proceeds in terms of the law of temporal displacement or vertical decalage. The construction of an earlier stage must be constructed at a later stage. Piaget calls this as re-learning and it requires on the part of individual to pass from one stage of consciousness, for example, sensory motor stage to

the next higher one, for example, representation. This relearning is sometimes characterized as 'redoing' the work of coordination between assimilation and accommodation. It is a repetition of the construction that occurred on the earlier plane but is now carried out on the higher plane. It represents a re-equilibration involving the creation of a new structure. Such a displacement, lag, or decalage occurs when the child is able to do something at the earlier stage (for e.g., understand spatial relations in terms of correctly acting in its environment) but cannot do so at a higher stage (e.g. represent spatial relations propositionally). Thus one should expect that such a displacement would normally be present and would last a certain length of time as the relearning or reconstruction occurs. This would be followed by a closing of the gap as a new structure is formed and becomes re-equilibrated. Such a reconstruction involves reflective abstraction.

7. *Reflective abstraction*: In the course of development each stage is constructed by means of a principle of reflective abstraction. Elements of the previous stages are abstracted and reflected onto a later and higher stage and then it is constructed into a new whole. Thus the whole concept of reflective abstraction is basic for understanding the related concept of the grasp of consciousness, egocentricism, introspection, and vertical decalage and so on.

Reflective abstraction is an important mechanism which may explain the way that individuals construct conceptual knowledge. Piaget used the notion of abstraction to describe a subject's interactions with external objects and the subject's internal mental operations. Von Glasserfeld's distinguished between three types of reflective abstraction:

(1) reflective abstraction (2) reflected abstraction and (3) pseudo-empirical abstraction. His summary is particularly useful since he relied on Piaget's original writings in French and attempted to maintain the distinctions between the different types of reflective abstraction. The first level of reflective abstraction is defined as recognition. The recognition level is the ability to recognize characteristics of a previously solved problem in a new situation and to believe that one can do again what one did before. Individuals operating at this level would not be able to anticipate sources of difficulty and would be surprised by complications that might occur as they attempted their solution. The second level of reflective abstraction is representation. Representation is described as the level where a student becomes able to run through a problem mentally and is able to anticipate potential sources of difficulty and promise. Individuals who operate at this level are more flexible in their thinking and are not only able to recognize similarities between problems, but are also able to notice the differences that might cause them difficulty if they tried to repeat a previously used method of solution. Such individuals could be imagined using the methods they might encounter but they cannot take the results as given. At this level, the subject would be unable to think about potential methods of solution and the anticipated results of such activity. The next level of reflective abstraction is called structural abstraction. Structural abstraction is said to occur when the student evaluates solution prospects based on mental run-throughs of potential methods as well as methods that have been used previously. The student is able to discern the characteristics that are necessary to solve the problem and is able to evaluate the merits of a solution method based on these characteristics. This level evidences

considerable flexibility of thought. The final level of reflective abstraction described is structural awareness. An individual operating at this level is able to anticipate the results of potential activity without having a complete mental run-through the solution activity. The problem structure created by the individual has become an object of reflection. The student is able to consider such structures as objects and is able to make judgments about them without resorting to physically or mentally representing methods of solution. This levels of reflective abstraction described above indicate that as individuals attain the higher levels, they become increasingly flexible in their thinking.

Piaget's four stages of development of knowledge, is the process of the development of knowledge that is based on three principles namely assimilation, accommodation, and equilibration. *Assimilation* is when a child incorporates new objects or events into existing schemes. *Accommodation* occurs when a child must modify existing schemes to incorporate new objects or events. *Equilibration* is described as the "master developmental process". It encompasses both assimilation and accommodation. It is most evident at the end of a developmental stage. At this point, the child begins to find shortcomings in their way of thinking. This results in disequilibrium, which is overcome by moving to the next stage. In other words, the child moves from disequilibrium at one stage to equilibrium at a higher stage.

CHAPTER IV

PIAGET'S EPISTEMOLOGICAL CONTRIBUTION

Piaget's epistemology can be located in the discussion of two most important questions, namely: 1) what is his basic epistemological outlook? And 2) how does it differ from traditional philosophical epistemology? It we look back at the history of Western Philosophy, there are various theories advanced to answer the above questions. Some of them hold the view, that knowledge comes from the senses and is reducible to a collection of sense impressions. Some others state that knowledge comes from the creative activity of the rational mind. The above explanations, clearly state that traditional theories focused on the questions that were both reflective as well as abstract in nature. The next set of questions that arises is 'What problems should epistemology investigate?', 'What are the limits of our knowledge?' 'What methods should one employ in epistemology?', 'How can epistemic claims be justified and by what criteria?', 'What is the nature of knowledge?' Reflection on the above reveal two kinds of epistemological questions, those dealing with knowledge '(epistemology proper)' and those dealing with conceptual questions about this theoretical activity (a theory of epistemology). Contemporary thinkers such as William Alston (1978), R. Brandt (1967), Ernest Nagel and R. Brandt (1965) have suggested that, just as a distinction is possible between normative ethics and meta-ethics, a similar distinction between normative epistemology and meta-epistemology could be drawn. Normative epistemology would include questions that are reflective in nature, which include questions such as 'how does Piaget's epistemology differ from the traditional philosophical epistemologies of

rationalism, empiricism, Kantianism, pragmatism, etc.', 'Where does Piaget fit into these views?', 'Is it correct to label him as "Kantian" or is his epistemology sufficiently different to make him "non-Kantian"?', 'If he is non-Kantian, what other epistemology best captures his basic outlook?', 'Does he have a dialectical epistemology?'. Whereas meta-epistemology would discuss questions such as 'how epistemology differs from science?'

The first part of the chapter is purely on Piaget's "normative epistemology" whereas the second half is his 'epistemology proper'.

Piaget is not an "empiricist". For Piaget, classical British Empiricism like that of Locke, Berkeley and Hume, and the altered versions of John Stuart Mill, Positivism, Logical Empiricism are categorically wrong. He has cited the following reasons. He strongly criticized empiricism because according to empiricism "all knowledge, originates in external or internal experience and experience is a 'reading off' or recording of properties already organized either in the object or in the subject"[74].

Empiricism is primarily a certain conception of experience and its action. Though empiricism considers experience as impossible without the subject at the same time it also states that experience takes place without the actual activity of the subject. As a result, empiricism regards experience as existing by itself, either owing its value to a system of external readymade "things" or of given relations between those things (metaphysical empiricism), or consisting in a system of self-sufficient habits and

[74] Robert, L. Campbell, *Jean Piaget's Genetic Epistemology: Appreciation and Critique*, Institute of objectivist studies seminar, Charlottesville, UA, July, 1997.(Http:hub.clemson.edu/~campber/index.html)

associations (Phenomenalism). This dual belief in the existence of an experience in itself and its direct pressure on the subject's mind explains why empiricism is necessarily associanist. Every method of recording experience other than association in its different forms (conditioned reflex, "associative transfer", associations of images, etc) presupposes an intellectual activity partaking of the construction of the external reality perceived by the subject.

Piaget criticized empiricism. The reason was empiricists maintained that mind was passive when acquiring knowledge and experience comes as a readymade structure. That's because for Piaget, whatever structure knowledge has, it is due to the subject's creative activity of constructing it. The fundamental problem that Piaget recognizes with empiricism is its commitment to the *'copy theory of cognition'*. Piaget states that "Empiricism maintains that the function of cognitive mechanism is submit to reality, copying its features as closely as possible, so that they may produce a reproduction which differs as little as possible from external reality. This idea of empiricism implies that reality can be reduced to its observable features and that knowledge must limit itself to transcribing these features"[75]. This view seems to characterize Locke's view of 'representative realism' and some later versions of empiricism that are currently popular among scientists. These views are not true in the case of Berkeley, Hume and Mill.

Piaget rejects the copy theory of cognition which states that the epistemic subject is passive and that experience is a direct recording of the observable features of an external object and that observations are free of conceptual elements. Of course, Piaget

[75] Jean, Piaget and B, Inhelder, *'The Gaps of Empiricism'*, In A. Koestler and J.R.Smythies (eds), Beacon Press, Boston, P. 118.

has a slightly different interpretation of 'empiricism'. He does not deny that science is empirical and that theories must be testable, or that experiments and observations are crucial to science. His concern at this stage is to how to interpret the term 'empirical' and 'experience'. Classical empiricism interprets knowledge consisting of "passive reading off" or mechanical recording of sense–data. A sensation for an empiricist is free of interpretation and judgment and hence certain. In the context of science, empiricism takes the form of maintaining that scientific observations (facts) are free of interpretation and are there to be recorded and collected by the scientist. Scientific progress consists in the progressive accumulation of theory free facts or "data". This view is rejected by Piaget. Piaget states that "Observation is never infallible or devoid of theoretical conceptualization, scientific facts can never be what the empiricist claims to be-scientific views include not only logico-mathematical reasoning but also epistemological reflection and conceptual analysis. Thus, scientific experimentations are empirical but need not be interpreted in an empiricist way"[76].

Piaget called empiricist theory of knowledge as a "copy of reality". This is because, the knower is not only a passive recorder of what is known, but he or she cannot be said to be a faithful recorder too. On the contrary, the knower is essentially active in the process of knowing and in fact, can be said to construct certain essential features of the object as known.

Scholars such as (Howard Gardner and F.G. Wetzel) have argued that Piaget is a rationalist in essential respects. Validity of such position depends on what one means by

[76] Jean, Piaget, *Epistemology and Psychology of Functions*, Kluwer Academic Publication, June 1997, P. 69.

the term 'rationalism'. Richard Kitchener in his analysis recognizes two kinds of rationalism: one is the 'epistemological rationalism' and 'rationalism as a general intellectual outlook'.

According to Piaget, the epistemological rationalism of Descartes and Leibniz is distinct from the epistemologies of Plato and Aristotle in that modern rationalism "discovered the epistemic subject". Modern rationalism stressed the crucial role of mathematics and logic in the epistemic enterprise and in these sciences the subject has a crucial role in constructing proofs and formal systems. Both Descartes and Leibniz, however, really remained "in a position intermediate between the absence of a subject in Plato and Aristotle and the structuring subject of Kantian apriorism"[77]. Though Piaget recognizes this type of rationalism, he considers it as inadequate. The reason is that most of these views attempt to answer questions such as 'how the mind can know the external world', 'God', 'self' and 'necessary truths' with the help of the "innate ideas". This ultimately leads to proposing pre-established harmony between the subject and object. Piaget characterizes this as a "structure without genesis" [78].

Although Piaget criticizes classical rationalism, in several respects he sees himself, as a 'rationalist'. He believes like a rationalist that knowledge is organized and structured in a complex way and that the source of this organization lies in the "epistemic subject". Piaget also believes that the basic unit of knowledge is more complex than a sensation or an atomic fact. Simple knowledge always pre-supposes a prior (formal) conceptual element typically a logico mathematical kind. An experience always involves

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[77] Cf., _____, *Insights and Illusions of Philosophy* (trans. W.Mays), Meridian Books, New York, 1971.
[78] Ibid...

an assimilation of the sensation or sense data to an earlier conceptual scheme or concept. Such assimilation is equivalent to the rationalist judgment. The basic epistemological unit is judgment which is an epistemological unit with a cognitive complexity that involves rules, categories, schemas, and principles. The schemas are related to each other in a complex formal structural way. They always have a holistic character. A cognitive element, therefore, cannot be treated separately but only as a member of a larger network of elements, that are internally related to each other. No experience, which is always laden with cognitive concepts, can be certain, for experience always goes beyond the given. The structure and organization peculiar to knowledge resides not in the external world but in the subject and its cognitive endowment. The subject is essentially active in the knowing process.

Piaget goes further to criticize the views of rationalism with regard to innate ideas. He states that to say that an idea is present from birth is to say that the individual is aware of the idea. He is conscious of it at the time of birth. Secondly, if someone, says that ideas are inborn, it would mean that the ideas are present in birth in the potential form, and that there is an inborn faculty or power such that, if the mind has the appropriate experiences and matures sufficiently then at a later time, when proper occasion arises, idea will be generated by this mental faculty. This will become conscious before the mind.

These are some of the different interpretations of the term "innate" in the dispositional sense and are perfectly compatible with the view that the mind must mature, that experience is necessary in order for the disposition to be realized. This faculty

develops through a series of stages and complex interactions between the organism and the environment. Hence, an innate disposition is compatible with maturations that is learning in stages. Descartes and Leibniz believed in ideas that were dispositionaly innate. It was in this sense, Piaget differed from them. The Classical Rationalist argument was that mind does not develop but is fully formed at birth. Piaget admits that the functioning of the mind is innately fixed at birth, but denies that its structure is. According to him, the development of this structure follows a rational order.

The second type of rationalism expresses an intellectual outlook that can be seen in the 18th century "enlightenment". The themes that characterize this outlook are *"reason", "nature" and "progress".*

According to the philosophers of the enlightenment "reason is a natural faculty or organ possessed by everyone. It is the same in all persons and under natural conditions always functions in the same way. However, environmental conditions (e.g. society, religion, superstition, authority) can interfere with and corrupt the natural functioning of reason. But if healthy environmental conditions were present, reason would be able to attain "enlightenment" and would progress. The paradigm case of reason operating to produce such knowledge and enlightenment was science"[79].

According to this view, reason has the power to disclose the unlocked secrets of nature and enlighten people for better living. It overcomes the influences of religion, convention, illusory sense experience and so on. These views of the enlightenment period had influenced Piaget and as a result he centered his interest on the nature and

[79] Richard, F Kitchener, *Piaget Theory of knowledge Genetic Epistemology and Scientific Reason*, Yale University Press, London, 1986, P. 73.

development of reason – scientific reason. This made him realize that the essence of humanity consists in 'rationality'. Piaget believes 'reason' is the same for everyone- "natural endowments". The characteristic manifestation of reason is "logic and mathematics" where reason functions at its best and attains clearest results. Piaget states that "the highest form of rationality is logic which means equilibrated formal operations"[80]. Considering what the enlightenment precursors have said, Piaget sees this progressive attainment of rationality as a function of the exercise and development of reason, which is autonomous and resides in the individual subject. On the basis of reason, Piaget feels that the individual must decide when social customs and conventions are reasonable to adopt, what social authorities (if any) one should follow and what coercive social influences to combat. Like the philosophers of the enlightenment, Piaget has faith and confidence in the ability of reason to know the natural world and to progress towards emancipation. When one says reason knows the world, it is scientific reason that does so, and science is the only way to attain knowledge. This also implies that logic and mathematics are necessarily involved, since mathematical knowledge is the hallmark of scientific knowledge. Reason has been produced by the organic and evolutionary realm. Piaget's biological epistemology reflects this outlook. The notion that organic life (nature) is the source of reason underlies Piaget's explanation of how logico-mathematical structures (with their necessity) can agree with nature (and its structures). In the course of human development, as in the history of science, there has been progress in our knowledge and an increase in our rationality. We have progressively and in a

[80] Cf., Jean Piaget, *The Principles of Genetic Epistemology*, Trans. Wolfe Mays, Routledge and Kegan Paul, London, 1970.

rational way overcome ego-centrism, socio-centrism, historio-centrism, illusions and ideologies. Reason evolves, and evolves rationally. It is just as there is an underlying logic and rationality in the evolution of a biological species. All evolution is directed tendency. It is a vector toward increasing equilibrium (rationality) occurring via rational developmental processes. Piaget states that the "central task of epistemology is to explain how a transition is made from a 'lower level' of knowledge to a 'higher' level of knowledge. This is applied both to stages of scientific knowledge and to stages of individual knowledge"[81].

Whether Piaget can be called as Kantian or not, is itself a complex question, and an answer to such a problem can be sorted out, only if one discusses several distinctions and qualifications. Though Piaget seems to be Kantian in several respects, there are differences too. Certain essential ingredients or contents of Kant's philosophy are retained or accepted by Piaget, the others are being rejected. Piaget considers the empiricism of Locke which he found inadequate since it was based on the copy theory of cognition. Rationalism, though denied the copy theory cognition, stressed on the "subject" playing an active role in cognitive process, also proved inadequate. ".....prior to Kantianism the choice as pre-formism, as yet very static, involving the hypothesis of innate ideas, and the beginnings of a constructivism still very tentative and incomplete involving the hypothesis of an intellectual attainment as a function of experience. The most natural synthesis consisted therefore in retaining the concept of construction at least under the form of synthetic judgments, and the idea of innateness at least under the form

[81] Richard Kitchner, 'Genetic Epistemology, Normative Epistemology, and Pyschologism', *Synthese,* No. 45, 1980, P. 267.

of priority as far as experience is concerned"[82]. With this arose Kant's apriori constructivism in which intelligence is not limited to receiving impression like a *tabula rasa* but structures reality by means of apriori forms of *"sensibility and understanding"*. Kant emphasized the active, cognitive role of the epistemological subject in interpreting, categorizing and structuring experience. This was accepted by Piaget when he argued that "we have knowledge only because experience is structured in a certain way. To know is to assimilate reality into a systems of transformations " [83].

Knowledge involves the assimilation of "reality" or sensations into a cognitive structure consisting of schemes, concepts, images and operations all of which are ordered and related in a certain way. For Kant, this assimilation entailed construction and synthesis. This is also accepted by Piaget. The subject for Piaget constructs the epistemic object. And in doing so, synthesizes incoming data via certain operations and structures. This is Piaget's constructivist epistemology that is essentially Kantian and maintains not only that knowledge is constructed by the subject but also that the epistemic object and the categories themselves are constructed.

The crucial role of Kant's concepts in processing information is seen in Piaget's work. According to Piaget, we know the world only in so far as it is assimilated in our cognitive structures. Apart from this Kant also believed that by means of these structures, which reason necessarily imposes on incoming sensory data, the mind makes experience itself possible. Epistemic subject is engaged in a construction of knowledge,

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[82] Jean, Piaget, *'Insights and Illusions of Philosophy'*, (trans. Wolfe, Mays), 1965/71, P.129.
[83] _____, *'The Principles of Genetic Epistemology'*, Trans. Wolfe Mays, Routledge and Kegan Paul, London, 1970, P. 15.

experience and phenomena. These views were accepted by Piaget and thus agreed with Kant on certain concepts or categories that are necessary for us to have knowledge. The basic points stressed by Piaget in the Kantian views were a certain number of principles, notions or schemes which it is impossible not to use. These were the formal laws of logic, the notion of time and space and the ideas of cause, quantity and classification. These notion from which the mind cannot escape, are precisely (following Kant) those which thought possesses itself and which it imposes on experience.

Whatever categories that Piaget acknowledged from Kant, he never denied their importance. In fact, his empirical research has been largely devoted to a scientific analysis of the development of categories. What Piaget states is that Kant's categories are not fixed and static but evolving and developing. This development is both rational and logical. Piaget thus agrees with Kant's general cognitive interpretation of knowledge, his constructivism and certain concepts of reason that are "necessary" for experience. But it does not follow that a particular interpretation of concept is necessary. Piaget is called Kantian because he accepted certain epistemological concepts that are necessary for knowledge, especially for scientific knowledge. Those concepts are basically used in science. This position is derived from the historico critical school of philosophy which Piaget accepted. The basic themes of this school was that the categories are not fixed in science, but they evolve through history.

Piaget pointed out that, "Kant regarded the categories as fixed. They are imposed on the mind and on things once for all in a definite form. This hypothesis is psychologically false.....Renoviour and Cournot have given the categories a turn,

which it is no exaggeration to characterize as psychological. The task they have set themselves is to define the categories according to their genesis in the history of thought and their progressive use in the history of sciences".[84] In brief, Kant's categories are not fixed but evolve and develop in rational and logical manner. Thus, Piaget agrees with Kant's general cognitive interpretation of knowledge, with his constructivism, and with his claim that certain concepts of reasons are 'necessary' for experience. Any scientific knowledge must use concepts such as space and time, causality, object permanence, and numerosity. But it does not follow that a particular interpretation of space given by Kant is necessary.

Piaget and the other members of the historic-critical school did not believe in transcendental knowledge (transcendental which meant fixed and the same for all). Piaget did not believe in the 'finality' and 'fixity' of Kant's categories. For Piaget, they keep on changing, as it is observed in the history of science. Piaget takes the example of 20th century physics that has abandoned Newtonian and Euclidean interpretation of space and time, as well as their views of causality, permanence, material substance, and so on. Thus, Kant's claim that these particular notions are necessary (in any sense) seems questionable. Instead Piaget has always insisted that science is not fixed but open. Piaget states "There is every reason to expect that these categories will continue to evolve in its future course, since science is not fixed. However, their successor concepts, whatever they might be, will be related to them in a rational way. Such successor

[84] Jean Piaget, *Judgment and Reasoning in the Child,* (trans. M. Warden). Totowa, New Jersey: Littlefield, Adams, 1924/59, PP. 232-33.

concepts will be necessary for the scientific thought"[85]. If for example, determinism is no longer necessary in contemporary quantum physics, its successor such as statistical laws are employed. Piaget does not believe, therefore, in Kant's transcendental claim that these categories are necessary in a strict sense, nor does he believe in a transcendental method of knowledge as opposed to and superior to scientific method. As he has always claimed, no philosophical method---reflective, transcendental, phenomenological, and dialectical---is superior to scientific method; hence no knowledge is superior to scientific knowledge. From the above it follows that Piaget is claiming that if transcendental refers to "what is necessary to render intelligence intelligible then the transcendental evolves, since what is necessary to render (scientific) experience intelligible changes. Piaget also claims that he is concerned with the transcendental if this refers to "the structures constructed by the subject"[86].

Though Piaget accepts many views of Kant's philosophy the most significant point of difference between the two thinkers can be noted only with regard to the notion of "a priori". Piaget claims that Kant's concept of "a priori" is too inclusive. Piaget recognizes two distinct senses of the "a priori" - temporal priority and logical priority. Thus from a temporal perspective, the epistemic subject does not appear to possess its full and completely developed complement of cognitive categories and schemes at birth. These take time to develop and they constitute necessary conditions for experience in its robust (adult) form. One can see that Piaget attempted to construct a 'Kantian

[85] Richard, F Kitchener, *Piaget Theory of Knowledge Genetic Epistemology and Scientific Reason*, Yale University Press, London, 1986, P. 78.

[86] Ibid.....79

transcendental psychology'. This would be distinct from both empirical psychology and from transcendental philosophy and it would be both empirical and 'transcendental'.

Transcendental psychology refers "to those conditions which make human experience possible, those apriori elements that are necessary conditions for experience"[87]. It falls in between transcendental philosophy and empirical psychology. Empirical psychology differs from transcendental philosophy in being empirical and not being completely apriori, conceptual, and logical. It differs on the other hand, in not dealing with the vagaries of accidental facts and particular details and thus in not being a posteriori or contingent. A transcendental psychology is an attempt to explain the generative mechanisms that transform discrete sensations into coherent experience.

Thus one has to keep in mind that Piaget's theory is not an empirical psychological one but about how the individual develops. It is about an "abstract, ideal individual--the epistemic subject—a notion that seems to refer to the underlying rationality that is present in all humans. The epistemic subject is common to all individuals at the same level of development irrespective of individual differences, such as the activities of classifying, ordering, numbering are common to all normal adults. The method employed is the ordinary hypothetico-deductive method of science that postulates the existence of certain mechanism and stages by means of which this transformation would be explained. This method would thus attempt to show how it would be possible for the transformation of sensations into experiences to occur by showing how it would have to proceed in order for this outcome to be possible.

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[87] Ibid.....P. 84

Piaget insists that the epistemic subject is not a transcendental subject in the Kantian sense, nor an individual subjective ego. The subjective ego is an egocentric subject prone to subjectivity, illusion, distortion and irrationality; whereas the epistemic subject of Piaget is the de-centered subject, which is rational and objective.

Piaget's epistemology is the study and development of the epistemic subject and not the psychological subject. The epistemic subject is reason in the process of development. It might also be interpreted as a 'Cartesian ego' a Kantian 'Vernunft', or a Hegelian 'Geist'. For Piaget there is a common universal rationality which develops in the subject. Hence, he feels that his task is to chart this epistemological development instead of studying the accidental contingencies surrounding particular people and their individual differences. Psychologists study the latter whereas Piaget says the genetic epistemology studies the epistemic subject. Thus Piaget accepts one of the several senses of the word apriori and transcendental that is found in Kant's writings, namely, a priori means universal and necessary. Piaget accepts another sense of the word a priori and transcendental as that which the epistemic subject contributes to knowledge. But one sense in which Piaget rejects apriori is the one understood as "totally independent of all experiences". He feels that because the epistemic subject performs the construction as a result of its experiences in the world, there does not seem to be any apriori knowledge in this sense of the term.

There are also Hegelian influences on Piagetian epistemology. Piaget is fundamentally dialectical in his thinking. Because of this, his philosophy can be characterized as 'Hegelian'. Hegel, like Piaget, was fundamentally concerned with the

development of concepts and offered an "internal" history of them, a history of intellectual concepts. It is correct to say that Piaget had an ambivalent attitude towards dialectics manifested throughout his writings on dialectics. In an early article, for example, Piaget states that, "We believe in the dialectic in so far as it is the direct expression of innumerable interdependencies making up reality, but we do not agree with those dialecticians who admit the possibility of knowledge of these interactions other than a psychogenetic or historico-critical one. In other words, we believe in the dialectics of the real, (whether it is physical or mental) but not in a dialectical method capable by itself of solving the problems raised by these "dialectical situations", that is to say, by diverse circles or relations of interdependence existing in the universe or in thought "[88].

In his later works Piaget had differentiated between methodological dialectics from philosophical dialectics. In this distinction he did not concern himself with philosophical dialectics as it attempted to state what science should do and what it should not do. Besides that Piaget felt that it had tried to subordinate science to inferior form of knowledge. Piaget was in favor of methodological dialectics as one can see this as a clearest example in biology, psychology, and sociology. According to Piaget "in these areas disequilibrium and equilibriums or in general, the mechanisms of regulations and especially auto-organization constitutes a kind of causality which one can analyze in dialectical terms of conflicts; the notion of contradiction has a meaning whenever a subject is involved with its normative activities or an organism with a dual possibility of

[88] This is the original quote of Jean Piaget (1950d), *Epistemologie Genetique et Methodologie Dialectique, Dialectica*, 4, 1950, 287-95. It is quoted by Richard F Kitchener in his work titled *Piaget theory of knowledge genetic Epistemology and Scientific Reason*, Yale University Press, London, 1986, P. 88.

normal and abnormal states"[89]. According to Piaget, dialectical processes are involved the moment there is a historical development and hence progressive equilibration, either between antagonistic factors... or between positive and negative qualities when it is a question of evolved normative structures. Methodological dialectics, therefore, is a particular epistemological approach concerning the explanation of historical development. Such an approach does not represent a methodology distinct from science, but rather is common to all historical epistemologies that view development as something different from the result of a pre-established programming or a series of chance events possessing neither structuration nor equilibration.

Piaget employed such a dialectical method. There are several dialectical concepts running throughout Piaget's work, including 'equilibrium', 'stages', 'holism', 'the relation between epistemic subject and epistemic object', 'the spiral of the sciences', and 'reflective abstraction'.

Piaget also shared elements of pragmatism while articulating genetic epistemology. Brief similarities can be noted between Piaget and Pragmatism. Apart from the similarities there are certain problems that Piaget recognizes with Pragmatism. According to Piaget, the fundamental problem is that it is not concerned with knowing why a successful action works. Pragmatism is inadequate as it subordinates the true to the useful or scrupulous rational evaluation of human interest. In short the basic limitation of pragmatism is its concern with success (know-how), not understanding

[89] Richard, F Kitchener, *Piaget Theory of Knowledge Genetic Epistemology and Scientific Reason*, Yale University Press, London, 1986, P. 89.

(know-why). Piaget is also critical of pragmatism for its conventionalism and its theory of intelligence as "random grouping" toward a solution. But the similarities between Pragmatism and Piaget's epistemology are that both believe in the biological or evolutionary model of knowledge, in which an organism is forced to adapt to its environment by acting in various ways. Epistemology of Piaget focuses on organism's praxis. John Dewey a pragmatist, argued that we needed a 'reconstruction of logic', one that took 'praxis' as a model. This is something that Piaget accepts and claims that there is logic of action (knowing-how) before there is a logic of propositions ('A' knowing that). Logic of action is basically means-end logic, a characteristic element of pragmatism.

Further both Piaget and Dewey employ the stage model, a theory of levels, or hierarchy theory to conceptualize this relationship. Propositional logic is based upon logic of action, just as a stage is based upon earlier ones. The lower level is incorporated into a later level and sets constraints upon it, but the later level surpasses the lower level. Pragmatism is committed to naturalism. Its philosophy including logic and epistemology, as well as Piaget's epistemological orientation is also naturalistic. Both are opposed to transcendental epistemologies. Piaget states that "para-scientific epistemologies" are a special philosophical kind of epistemology, transcending natural, scientific knowledge. This is because for Dewey and Piaget, philosophy is continuous with science, just as science is a continuation of commonsense. Such a pragmatic naturalism however entails no reductionism or materialism. This was a point Dewey always insisted upon, and Piaget also endorses it.

A discussion of Piaget's epistemology that is fundamentally concerned with the following questions, 'How developmentally is a certain epistemic fact or property possible? How is it possible for the necessary truths contained in logic and mathematics to result from the contingent ones the child first encounters? How the epistemic objectivity of adulthood develops from the subjectivity and ego-centrism of childhood? How is it possible for objective social structures containing properties of justice, fairness and reciprocity to develop from individual behavior pattern lacking these features? How it is possible for scientific knowledge to develop from earlier modes of mythical and mythopoetic thought? How is it possible for reason to develop from causes and semiotic relations of signification and intentionality to develop from mechanistic movements and reflexes?

These are the questions that are posed by epistemology, and Piaget's general program of genetic epistemology is fundamentally concerned with such questions. Piaget always thinks that any theory of genetic epistemology must answer these questions. The answers are found in his 'epistemological constructivism', which states that "epistemic structures are not only necessary for knowledge, as .....but are constructed by the subject. That is , they are not innate in the child as some rationalist would argue, nor present in the environment as some empiricists would suggest, but are the product of an epistemic construction by the subject as a result of his or her interaction with and in the environment, a construction that follows a stage- like sequential course"[90]. At birth, the child does not have any epistemic structures and thus

[90] Cf., Jean Piaget, *Genetic Epistemology,* W. W.Norton , New York, 1971.

engages in action on objects, whereby action turns into operative and operations in turn abstracted through reflective abstractions to form increasingly complex structures. Thus some structures take on the properties of a group, or grouping including closure and its associate reversibility. Since a structure has these properties, certain propositions become truly necessary. The overall structure, of which they are part, requires these properties and also renders them possible.

Thus, the epistemic subject passes from an initial stage of absolutism, realism and ego-centrism to one of reciprocity, relativism and objectivism because the subject constructs a public three dimensional space in which he or she is one object among others. In such a scheme, each person has a point of view, or perspective that can be taken by the subject when considering questions of objectivity. "Objectivity pre-supposes relations of reciprocity, cooperation and justice, or in short, an equilibrium between respective points of view in which certain actions incur obligations because of principles of transformation operating"[91].

From this it is clear that "constructivism' is a central ingredient of Piaget's epistemology. And many philosophers of science feel that Piaget's constructivism claims to be scientific epistemology, one that is able to settle the age old dispute between realism and idealism, and rationalism and empiricism. Sometimes it is taken as a contender for a philosophical epistemology, rivaling between the classical positions of empiricism and Kantianism.

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[91] Richard, F. Kitchener, 'Piaget's social psychology', *Journal for the Theory of Social Behaviour*, 11, 1981, PP. 253-78

How is this epistemological constructivism to be characterized? As B. Inhelder pointed out: "knowledge is never a simple copy of reality, but always results from a construction of reality through the activities of the subject"[92].

According to Piaget, an infant constructs reality as the infant constructs the external world. He even titled his work, "construction of reality in the child". This idealistic constructivism is supported by Piaget's numerous criticism of realism.

Constructivism is the view that "reality itself is constructed by the epistemic subject. The subject also constructs the cognitive structures, categories, concepts and structures necessary for knowledge"[93]. Epistemic object is an intentional object, an object under some description, interpreted and seen from some point of view or perspective. It is an intellectual creation. The subject is actively involved in the process of knowledge and this activity involves the formation (construction) of an epistemic object as intentional. The underlying necessary epistemic concepts are not innate in the subject or pre-existent in the object they develop. These 'objects' develop when the subject interacts with the environment. Thus, according to Piaget, 'knowledge', the epistemic structures necessary for knowledge and the epistemic object itself are the outcome of the epistemic subject's interaction with environment via assimilation and accommodation.

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[92] Cf., Barbel, Inhelder, *Genetic Epistemology and Developmental Psychology.* In R.W.Reiber and K. Salzinger(eds.), The Roots of American Psychology: Historical Influence and Implications for the Future. Annals of the New York Academy of Science, 291, PP. 332-41

[93] Cf. Jean Piaget, T*he Construction of Reality in the Child*,(trans. M. Cook), (1937/71) , Ballantine, New York.

This construction should not be understood as arbitrary creation out of nothing as an act of fancy or imagination. If so then it would be only creation and not a construction. Construction is there only when there is an interaction between the subject and the external environment. Environment has a vital role to play, as it provides the elements or data (e.g. an image) by setting certain constraints in acceptable construction.

From the above discussion it can be said that Piaget's theory is more in favor of cognitive development rather than calling it a part of psychology in the traditional sense. Piaget was engaged purely in constructing a full-fledged epistemology, an epistemology of scientific thought. Therefore he is called a "genetic epistemologist". There are two features that make his epistemology apart from the rest of the views. Firstly, Piaget's epistemology is not a priori philosophical theory of knowledge, but rather one that is explicitly based upon scientific knowledge. Evidence is taken from psychology and therefore it turns out to be empirical or naturalistic. Secondly, this epistemology is different from other epistemologies in the sense that Piaget's epistemology is genetic, evolutionary and developmental. It is concerned with the development of knowledge, with the epistemic dynamics underlying the change from one epistemic stage to another, and not merely with knowledge in a fixed, static or a temporal way. As Kitchener stated "Piaget epistemology may be characterized as the study of knowledge as a function of its development, the study of the mechanism of the increase in knowledge, the study of the

successive states of a science S as a function of its development. The study of the transition from a state of lesser knowledge to a more advanced state"[94].

Piaget's epistemology is both a historically oriented philosophy of science and a theory about growth of knowledge in the individual person.

Piaget conceives his theory of growth of knowledge in the individual person---- the ontogenesis of knowledge---- to be a direct extension and in fact completion of this historico critical philosophy of science[95]. Piaget argues, if the historico-critical philosophy is correct in maintaining that the nature of reason is only known in the course of its development, one cannot limit oneself merely to the study of the history of science. One must also study the historical development of reason prior to the rise of science, e.g. In pre-Greek cultures, in primitive cultures, in the proto-huminiods, in the biological evolution of the species, etc. In addition however, one must also study the development of reason in the individual especially since unlike the preceding historical areas, this study of the ontogenesis of knowledge is an observational and experimental science. Piaget therefore considered his mission to be the extension of the historico-critical philosophy of science onto the individual, ontogenetic plane, leading thereby to the empirical investigation of the growth of knowledge in the individual. Although the study of the ontogenesis of knowledge in the individual has been his particular area of empirical research, he not only takes the scope of genetic epistemology to be both the history of science and individual epistemic development but also writes extensively on

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[94]Richard Kitchner, 'Genetic Epistemology, Equilibration and The Rationality of Scientific Knowledge', *Studies in History of and Philosophy of Science,* Volume, 18, P. 340.

[95] Ibid...P. 341.

historical philosophy of science. He also held academic positions in the history and philosophy of science.

What views can the genetic epistemology of the individual shed on the genetic epistemology of science? The answer to this question can be seen in Piaget's theory of cognitive development that is already discussed in the previous chapter. A theory of the growth of knowledge in an individual is intended to have an important contribution to make towards understanding the growth of scientific knowledge.

A theory of scientific or epistemic progress is concerned with a variety of questions: 1) In the course of epistemic change, has there been real progress or merely change? If so, what is the nature of this progress? 2) Is there a final goal towards which science is progressing? If so, what is this goal? Could there be something like the ultimate or final answer encapsulated in the ultimate scientific theory? Or do we approach this final picture in the manner suggested for example by Popper's notion of verisimilitude? What is an adequate criterion by reference to which we can determine whether we are approaching this final epistemic goal? 3) Since progress entails improvement in our knowledge, what normative standard of comparison is involved here? How can we define the notion of one theory being epistemically better than another one?

According to Piaget, there is always progress where our knowledge of the world is concerned. This progress occurs both at the historical level (with the growth of scientific knowledge) and also at the individual level, the growth of knowledge from childhood to adulthood. The reason for Piaget's claim is primarily twofold: Firstly, if we

look at the history of science such a claim appears obvious. This indicates there is progress in individual development. Everyone would seem to admit, for example, that adults know more than children do and know it in a more adequate way. This intuition about progress, Piaget seems to accept without much question. Secondly, Piaget offers the following argument characterizing the course of epistemic change as 'progressive'. If there were no progress, then reason would not evolve rationally. Thus if epistemic change is to be rational, then there must be progress in this change. For example, there were mere epistemic change, say, from t1 to t2. Suppose one also maintained like Piaget, that reason not only changes over time, but that reason evolve rationally. If there were some epistemic change, we would have to know why, and if reason does not change without reason, then underlying the epistemic change, must have been some reason. But, the only likely explanations seem to be that a later epistemic structure was better, than improvement over an earlier one. Hence, if reason evolves rationally there must be progress.

There is a pattern to be found in the course of evolution, a pattern that shows a direction or directional tendency (vector). In biology, this claim is sometimes called 'orthogenesis'. Piaget believes that such orthogenesis is present not only in biological evolution, but also in epistemic development. For Piaget, orthogenesis or directional vector is a tendency or 'press' towards an ideal equilibrium between organism and environment (in biology) and between epistemic subject and the epistemic object (in epistemology). Although the notion of orthogenesis appears to be out of vogue in contemporary biology, Piaget consistently claims that this notion is necessary, if we are

to understand and correctly interpret evolutionary biology. Piaget criticizes orthodox, neo-Darwinism (selection theory) for its commitment to the notion of randomness and chance. Piaget's assumption here is taken from 19th century thinkers such as Bergson, who says that either evolution is contingent and hence irrational or it has a direction and is rational. If evolution is a temporal process that occurs randomly, contingently or because of 'chance' it is tantamount to believing it occurs irrationally. If something were to evolve by random mutations and selective pressure like Campbell's model of evolutionary epistemology, this wouldn't constitute a rational explanation of evolution although it might constitute some kind of causal explanation. If something evolves or develops not by chance or contingently, there must be some underlying intelligible pattern to this development and this development must involve progress and direction. Development for Piaget is rational as "only if one can ascertain an actual case of progress indicating an ideal orientation, which would not antedate this evolution but which is emergent and which will partly control the development to come"[96]. The above mentioned argument has its greatest appeal with regard to the development of reason. And Piaget believes that this is also applicable to biological evolution.

Orthogenesis was rejected by most of the contemporary biologist partly for empirical reasons and partly for conceptual reasons. It was argued that 'orthogenesis' is teleological. By something's being 'teleological' E. Mayr apparently means "either that it is case of finalism or vitalism that is either teleology commits one to the belief there are final(future) goals directing, controlling or causing the process "from the rear" or

[96]Ibid..... P. 345.

teleology commits one to the view that there are non-natural agents controlling this process. For this reason, evolution is not teleological afortiori and not orthogenetic"[97].

In the interpretation of orthogenesis, Piaget accepts everything what E. Mayr says about 'teleonomy'. According to Piaget, orthogenesis is not a final cause nor an apriori agent directing evolution. It is a directional vector. Orthogenesis is not, a version of finalism. It is gradual progress towards equilibrium involving a direction. Epistemic change follows a retrospective pattern of orthogenesis, a directional tendency towards increasing equilibration. Thus there is true progress. But what can be said about the ultimate goal of this progressive tendency? Are we progressively attaining or approximating knowledge of reality itself? Is our current knowledge closer to the truth than earlier modes of knowing? Could science ever provide us with a final and finished theory of the ultimate picture of reality? Piaget addresses these questions by arguing about the basis of science and the development of scientific knowledge.

According to Piaget, it is only by a series of successive approximations our knowledge approaches the object itself, but only as a mathematical unit. Epistemic progress and orthogenesis are intimately connected to the central principle of Piaget's genetic epistemology--the concept of equilibrium and the correlative notion of equilibration. Piaget states that "the central concept in our explanation of cognitive development (whether we speak of the history of science or of psychogenesis) is therefore that of successive improvements of the form of equilibrium; in otherwords, of

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[97] E. Mayr, '*Teleological and Teleonomic: a New* Analysis', Boston Studies in the Philosophy of Science, vol. XIV, P. .346

an increasing equilibration"[98]. The basic process of equilibration of becoming equilibrated to some degree involves the notion of an organism (or epistemic subject) and the environment (or what can be known). Due to Piaget's commitment to a biological epistemology, all organisms are conceived to be in a relation to adaptation to their environment to some degree. The basic feature of life itself is 'auto regulation'- of regulating oneself in relation to one's environment. In adapting to one's environment, the organism is forced to accommodate itself, to change and modify itself (including its cognitive structures) as a result of the constraints inherent in the environmental object. At the same time, the organism must assimilate the environment into its structures. When there is a balance between these two processes of assimilation and accommodation there is adaptation and a state of equilibrium is attained. There are only certain degrees of adaptation and equilibrium, since organisms can be adapted to their environment to varying degrees, but development consists of increasing the degree of equilibrium between one's cognitive equipment and the environment and as development progresses there is an increase in this equilibrium. There is this increase in equilibrium (or adaptation) when the subject or organism can satisfy more of its needs, more competently avert disturbances gain greater mastery over its environment etc. than it could before. Equilibrium, as an adaptation between assimilation and accommodation involves in an essential way the role of action (praxis), one important type of which constitutes transformation of one state into another. These (mental) actions Piaget calls 'operations'. These are fundamentally important. They possess the crucial property of reversibility.

[98] Jean, Piaget, *The Development of Thought: Equilibration of Cognitive Structures*, 1977, P. 30.

One can notice, two reversible operations of special importance, that is, individual are able to perform the inverse of something and hence to cancel or nullify it. When an organism has attained the ability to perform operations involving reversibility, the organism, is better adapted to its environment, since it will then be able to overcome obstacles and barriers to construct additional equivalent means to achieve its goals. Thus organism will have increased its power over its environment and it can be best aided to be in better equilibrium with it.

Piaget gives a detailed account on the notion of 'epistemic' change. An account of growth of knowledge addresses the question 'how does epistemic change occur? How can one explain the transition from one epistemic theory t1 to another one t2? According to one view, such questions address issues such as why did scientists abandon or modify t1? Why did they create and accept t2? Why did this change take place in the particular way it did? Central to the issue, would be the question whether the explanation of this epistemic change is a logico rational one in terms of 'good reasons' or an 'external causal' one. The fundamental aim of Piaget's entire program of genetic epistemology concerns the question of the nature and explanation of epistemic change. It is due to this reason, that Piaget defines this genetic epistemology as the attempt to explain the transition from one epistemic state to another. For Piaget, if an earlier epistemic structure is less equilibrated, it leads to a transformation on which a new epistemic structure is more equilibrated.

Several things must be noted from the above discussion. First of all Piaget, is not offering an explanation of why a particular individual abandons one theory and adopts

another. His theory of epistemic development concerns 'the epistemic subject' and not the psychological subject' or 'individual subject'. The epistemic subject for Piaget is an idealized abstraction namely, that set of underlying epistemic structure common to everyone at the same level of development. Thus in offering equilibration as the explanation of epistemic transition in science, Piaget would not be offering an account of why a particular individual scientist abandoned one theory and adopted another one. Piaget's account would be about why the epistemic subject--what one could call the scientific mind or scientific reason-- made the epistemic transition, say, from Ptolemaic astronomy to Copernican astronomy. In short an equilibrium explanation would be about why an idealized subject – historical reason made a particular transition. An equilibrium explanation really concerns the epistemic relations between two cognitive or scientific theories and the epistemic transitions from one of them to the next. An equilibrium explanation offers a certain kind of explanation for why one structure was better than another. Why it was rational to switch from structure-I to structure-J and why, in historical facts it did occur. In short, an equilibrium explanation (as suggested by R. Kitchener) is closely related to Popper's world 3 and not merely to world 3. It indicates what was the rational thing to do from our retrospective point of view. What is the nature of the equilibrium–type of explanation? First, of all, such an explanation is retro-dictive, that is to say, it is an explanation of a past epistemic transformation. Secondly, an equilibrium explanation is an explanation involving reason as opposed to mere causes. A reason is cognitive in the sense that it involves what some philosophers call 'propositional content' or what Piaget calls as 'semiotic relation' between states of

consciousness. When we give an explanation of epistemic change by invoking the principle of equilibration, we are offering an explanation in terms of reasons. We give reasons as to why one epistemic structure was objectively better than other structure, so also the transition from Si to Sj was a rational one. Equilibrium, explanation is not wedded to a model of explanation in terms of mechanistic causes. Equilibrium type of explanations is primarily one involving internal factors, and the external ones are secondary. An external explanation is an explanation that appeals to economic, political or sociological factors whereas internal explanations typically involve an appeal to intellectual factors 'within'.

Scientific rationality for Piaget, is based purely on his theory of equilibration just as one can see Piaget's entire theory of cognitive development as an attempt to construct a theory of historical rationality-one rooted in biology. As a moderate, Piaget, believes that reason manifests its rationality not so much in its static structures present at a particular instant of time-although such structures can be said to be rational because equilibrated- but by the manner in which it changes, that is to say in their functioning over time. There is a rational unfolding of reason and a particular sequence of structures of rationality because 'reason' is constructed by reason. The construction is rational construction in which there is an increase in equilibration and the essence of this equilibration lies in the reversibility of thought. This increasing reversibility depends on the formation of certain kinds of structures, namely those, implicitly defining reversibility by jointly containing certain permissible transformation, e.g. inversion, reciprocity, etc. Hence it is in the very structures of thought, those containing maximum reversibility that

rationality and equilibration lie. In short, Piaget has a structuralist's conception of rationality. In this type of rationality, the epistemic subject is rational and not the individual person. This, in turn, means it is the underlying abstract structures that are really rational and not individual *per se*. Rationality lies beneath the surface in the unconscious structures, unevenly present in everyone. Rationality thus appears to be an impersonal, non-subjective affair involving logical structures present in something like Popper's world 3.

According to historicism reason changes over time and this includes the underlying rational norms. As a result, some historicist has been led to conclude that reason cannot claim to be objective. In contrast to this, Piaget claims that reason does change. It is rational in the very way it changes. Hence reason remains objective. Piaget agrees with those individuals who argue that norms or criteria of rationality are not permanently fixed once and for all but have changed over time. According to Piaget, they change both in the course of individual development and in the history of science. Piaget stated that "....reason was built up by stages and continues to evolve, not without reason or reasons but in such a manner that not only is the evidence transformed but even that which appears logically demonstrated or rigorous at a given stage may subsequently appear doubtful and may give rise to considerably greater degrees of rigour"[99].

The structure of rationality in an individual is stage dependent and relative, changes over time and consequently one cannot claim that rationality is absolutely fixed

[99] Cf., Jean, Piaget, *Main Trends in Interdisciplinary Research,* New York: Harper, 1973, P. *34.*

and permanent. Further, the evolution of rationality is always a directed one with an underlying rational pattern-the developmental transition follows a rational course.

According to the historicist claim, reason varies from one historical era to another historical era. However, the function of reason- to seek and construct equilibrated structures-remains invariant over time. The way reason constructs these rational structures can be characterized as involving a diachronic or developmental rationality. D. Kuhn, states "developmental rationality, develops over a period of many years that often extends well beyond childhood without even attaining a definitive state of maturity".[100] Logic comes early in the development of rationality. The transition from inference to reasoning is not a transition from illogical inference to logical inference or from heuristic inference to analytic inference. Rather it is the development of increasingly explicit knowledge of properties implicit in the variety of inferences one already makes. Novelty resides not in facts or skills that emerge from genes or are taken in from environments, but rather in emerging conceptual knowledge about inferential abilities one already has. Progress in rationality comes through reflections on our inferences. Such reflection might enable an individual to determine that a particular inference is logically necessary because there is only possible conclusion. A further reflection may enable the formulation of a more general coordination of necessity and possibility.

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[100] Cf. D. Kuhn, '*Theory of Mind, Metacognition, and Reasoning: A life span Perspective. In* P.Mitchell and K.J.Riggs (eds)', Children's Reasoning and the Mind, Psychology Press, Hove, UK, PP. 301-326

Jean Piaget stated "developmental rationality, as much a process of coordination is also a process of reflection and both cannot be sharply distinguished"[101].

[101] Cf., Jean , Piaget, *Possibility and Necessity*, University of Minnesota Press, Minneapolis.

CHAPTER 5

IMPLICATIONS OF GENETIC EPISTEMOLOGY

The final chapter of this dissertation is dedicated to the evaluation of Piaget's 'genetic epistemology' in the light of contemporary epistemic, linguistic and hermeneutical investigations. It is in this context that Piaget's epistemology will be likened to philosophies of various contemporary thinkers such as Karl Popper, Thomas Kuhn, and Quine. The close similarities between the contribution of the contemporary philosophers function as complementing Piaget's epistemology and at the same time the task of defending a epistemic-linguistic-hermeneutical position easy. This does not imply that there are no radical differences between the specific philosophers mentioned above on the one hand and Piaget on the other.

Epistemology from the sixteenth century has undergone varied interpretations. The most significant amongst these interpretations is the notion of epistemology as understanding the nature and limits of scientific knowledge, particularly in relation to other systems of beliefs such as religion, ethics, and politics and even commonsense. The classical epistemologists like Descartes, Leibniz, Locke, Berkeley, Hume and Kant focused on problems and issues surrounding nature of knowledge. But with dawn of 20th century', views of thinkers such as G.E. Moore, Bertrand Russell, John Austin, Gilbert Ryle and A.J. Ayer did not ignore scientific interpretations in their epistemological pursuits. Nevertheless, epistemology was viewed as independent or autonomous

discipline that was concerned in answering questions that were basically non-scientific in its nature. The questions that epistemology was expected to answer were: 'what is the nature of apriori knowledge?', 'What is the nature of our perception of ordinary, common sense objects in the external world?', 'What general theory is most adequate?', 'What is a correct analysis of 'x' knows that 'P'?

Most of the analytic philosophers for instance, were of the opinion that the questions mentioned above had no connection with science. The question that analytic thinkers were interested arose from the ordinary non-scientific context such as elliptical pennies, tomatoes, white envelopes, the steps of the libraries. These examples have reinforced the view that epistemology is purely a philosophical discipline and it has no connection with science. This view was commonly shared by the Anglo-American analytic thinkers who were of the view that "epistemology was conceived as independent of science"; and that it had no business with science other than with religious, historical or ethical knowledge.

There were however some epistemologists like Keith Lehrer, Ernest Nagel, Karl Popper and W.V.Quine who viewed epistemology as fundamentally connected with science. Epistemology was also concerned with the foundations of science. These epistemologists, commonly called 'naturalist epistemologists' began to increasingly assert the relevance of science and scientific interpretation in their epistemological discourse. Karl Popper for instance viewed history of modern epistemology as the history of various philosophical reactions to scientific knowledge: "genuine philosophical problems are always rooted in urgent

problems outside philosophy... and in particular, problems in mathematics and science"[102].

Piaget agrees with Popper and Quine in holding the view that there is an inextricable relation between philosophy and science. Apart from this, Piaget also, agrees with Popper and Quine in holding the view that not only has science shaped epistemology historically, but at the same time one cannot sharply separate philosophy and science. Popper feels that the main concern of philosophy and science should be the search for truth and this is achieved by identifying the most urgent problem and trying to solve them by proposing true theories (or true statements or true propositions). Search for truth is possible if we speak clearly and simply and avoid unnecessary technicalities and complications. In view of Popper, "aiming at simplicity and lucidity is a moral duty of all intellectuals and lack of clarity thereby results into a sin and pretentiousness becomes a crime"[103].

Popper accepts the common theory of truth that speaks truth in terms of correspondence with the facts (or with reality). In other words, a theory is true if and only if it corresponds with the facts. This view was defended by Alfred Tarski and Popper too accepted this notion of truth. But Popper went to the extent of accepting truth and falsity as properties or classes of statements, that is, of (unambiguously formulated) theories of propositions (or meaningful sentences)

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[102] Richard, F Kitchener, *Piaget Theory of Knowledge Genetic Epistemology and Scientific Reason*, Yale University Press, London, 1986, P. 124.

[103] Cf. Karl Popper, *Objective Knowledge :An Evolutionary Approach,* Clarendon Press, Qxford, 1972.

of some language (*L1*) about which we can speak quietly freely in another language (*Lm*). This was called as the "meta language". To speak about the correspondence of statement to a fact, there is requirement of meta-language. With the help of meta-language we can state the facts about which the statements are made. In addition, we can also speak about the statement in question and vice-versa.

From this it is clear that once we possess such a meta language, we can speak about (a) the facts described by the statements of some (object) language, by the simple method of stating these facts; (b) the statements of this (object) language (by using the names of these statements) then we can also speak in this meta-language about the correspondence of statements to facts. Once it can be stated that the conditions under which each statement of the language *L1* corresponds to the facts, we can define, yet in keeping with the commonsense, "a statement is true if an only if it corresponds to the facts"[104].

Popper finds the views of Tarski on truth as objectivist or absolutist notion of truth. He believes that truth is "not absolutist in the sense of allowing us to speak with absolute certainty or assurance. For it does not provide us with a criterion of truth. On the contrary, Tarski could prove that if language1 is sufficiently rich for example, if it contains arithmetic then there cannot exist a general criterion of truth. Only for extremely poor artificial language can there exist a criterion of truth"[105].

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[104] Ibid.... P. 47.

[105] Cf., Alfred Tarski, 'The Concept of Truth in Formalised Language', in *Logic, Semantics, and Mathematics*, 1969, PP. 155-56.

Popper considered 'common-sense' as a naïve muddle. Yet it has provided the foundation on which even the most recent philosophical theories of knowledge are erected. The common sense theory is simple. If one wishes to know something that is not yet known about the world, then one has to open its own eyes and look around. One has to raise one's ears and listen to noises, especially to those made by others people. Thus our various senses are our sources of knowledge—the sources or the entries into our minds. This was called by Popper as 'the bucket theory of the mind'. This theory states mind is a bucket which is originally empty, or more or less so, and into this bucket (mind) material enters through our sense, and accumulates and thereby become digested. In the philosophical world this was *tabula rasa* theory of the mind. But the *tabula rasa* theory goes beyond the common sense bucket theory.

According to Popper, the greatest instrument of progress is criticism. For example, if someone wants to criticize a theory say, T1 then another theory, T2 is required that will furnish us with the necessary basis or starting point or background for criticizing T1. Assuming T1 as a consistent theory, one has to show that T1 leads to unintended and undesirable consequences or we have to show that there is a competing theory T2 that clashes with T1. Or we try to show that T2 has certain advantages over T1. Popper states that: "As soon as we have competing theories, there is plenty of scope for critical, or rational discussion: We explore the consequences of the theories, and we try, especially to discover their weak points--that is consequences which we thing, may be mistaken. This kind of critical or rational discussion may sometimes lead to a clear defeat of one of the

theories; more often it only helps to bring out the weakness of both, thus challenges us to produce some further theory"[106].

Reflecting on Popper's notion of "verisimilitude" and Piaget notion of "equilibration" one can observe a very close affinity in the epistemological process proposed by both the philosophers. Popper introduces the notion of verisimilitude by combining the two notions that were introduced earlier by Tarski 1) the notion of truth and 2) the notion of the (logical) content to a statement; that is, the class of all statements logically entailed by it.

Popper utilizes the ideas of Alfred Tarski, (especially his theory of truth) and his theory of consequence classes and deductive systems. Popper calls verisimilitude as 'truthlikeness'. This he explains by talking the help of theories. Consider he says, a theory T1 that has less verisimilitude than T2, this is possible if and only if (a) their truth contents and falsity contents or their measures are comparable and either (b) the truth content but not the falsity content of T1 is smaller than that of T2 or else (c) the truth content of T1 is not greater than that of T2, but its falsity content is greater. In other words, this is to state that theory T2 is closer to the truth or more similar to the truth, than T1, if and only if more true statements follow from it, but not more false statements, or at least many true statements but never false statements. This makes a theory potentially better theory, a more challenging theory. Thus, stronger the theory with greater content, the greater will be the verisimilitude, unless its falsity content is also greater. This feature forms the logical basis of the method of science - the method of bold

[106] Karl, Popper, *Objective Knowledge: An Evolutionary Approach,* Clarendon Press, Qxford, 1972, P. 35.

conjectures and of attempted refutations. Popper stated that: "A theory is the bolder the greater it's content. It is also the riskier: it is the more probable to start with that it will be false. We try to find its weak points, to refute it. If we fail to refute it, or if the refutation we find are at the same also refutations of the weaker theory which was its predecessor, then we have reason, to suspect, or to conjecture that the stronger theory has no greater falsity content than its weak predecessor, and, therefore, that it has the greater degree of verisimilitude"[107].

Thus the task of science is to cover as much as possible the true statement by proposing theories or conjectures that seems to be promising and as little as possible of the false area. The aim of science is 'verisimilitude'. Search for verisimilitude is a clear and a more realistic aim than the search for truth. The method of science is to adopt rational procedures for getting nearer to the truth.

Another reason that Piaget states that epistemology is essentially tied with scientific knowledge is due to linguistic justification. In English language, the word 'epistemology' does not connote 'scientific knowledge' whereas in French it does. The core sense of the Greek term '*episteme*' refers to certain knowledge that is characteristically found in science. Hence, French *epistemologie* can be taken as 'theory of scientific knowledge'(i.e., Philosophy of science),which would have as a German equivalent *Wissenschaftstheorie.* On the other hand, "general theory of knowledge" more suitably captures the French *theorie de la connaissance (or gnoseologie),* which would correspond to 'theory of knowledge' in English and *Erkenntnistheorie* in German. Even if this point is granted,

[107] Ibid...P. 53.

question remains whether there is a general theory of knowledge separate from *epistemologie* (i.e. scientific knowledge).

Further, Piaget argued that a general epistemology must become 'genetic', since the intellectual development of the person makes an important contribution to answering question posed by a philosophical epistemology. General epistemology is concerned with subject and object and this relationship is studied scientifically by genetic epistemology. To make his point, Piaget considers the between philosophy and science proposed by Popper and Quine. Piaget agreed with Popper and Quine, regarding the crucial relationship between science and epistemology. To determine that science and philosophy are different is to establish a 'criterion of demarcation'. Popper, however, believed that science is separable from non-science on the ground that scientific theories are falsifiable, whereas non-scientific including philosophical is not. Science is to be distinguished from non-science mainly by its method, that is, 'falsifiable'. They are not distinguished on the basis of subject matter. What makes a problem philosophical is its historical connection with the problems and theories which have been discussed by philosophers rather than connection with theories dealt with by physicists. For Piaget, science and philosophy cannot be demarcated by their problems. One cannot decide apriori if a problem is scientific or philosophical since the boundary between them is constantly changing as science advances. What seems to be philosophical problem often becomes a scientific one later. Science and philosophy differ mainly by its scope and methods and not by its problem. Philosophy is concerned with reality (both internal and external)

and their relations and tries to know reality (or being) as such and to attain a general co-ordination of human values. Science is more limited and manageable as it pursues very particular and modest questions that has restricted domains. It investigates only those questions that can be dealt with 'objectively' by a method which involves either formal logico mathematical deduction or experimentation and empirical verification.

The method of philosophy on the other hand, is that of reflection concerned not with the acquisition of scientific knowledge but rather with its quality and value. The method of philosophy is just a general attitude towards life, reflecting upon the philosopher's personality, the ideology of his or his social group and so on. There is no agreement among the individuals and even if there is agreement it is only fortuitous and not objective. It is only the method that distinguishes philosophy from science and not the problems.

Knowledge, in the broader sense for Piaget, refers to experimental verification and deductive reasoning that is lacking in philosophy. Therefore, Piaget feels that there can be no such thing as philosophical knowledge and there is no philosophical mode of knowing that is superior to science. But Piaget denies that he is a positivist fundamentally because he feels that there is no sharp a priori boundary between philosophy and science, as science has taken more and more areas of philosophy it becomes difficult to lay down a line of demarcation between philosophy and science. But although Piaget denies himself to be a 'positivist', he commits himself to positivism as he always maintained the view that only scientific knowledge, is true knowledge and rational progress is always

equivalent to the growth of science. For Piaget, philosophical knowledge to be associated with transcendental a priori knowledge. From this Piaget claims that epistemology can and has become scientific, hence independent of philosophy.

According to Piaget, traditional philosophical epistemology has made and continues to make empirical claims while supposedly engaging in purely normative or analytic endeavour. These empirical claims falsely show something else. Often these empirical claims wear the mask of philosophy and go forever undetected. This results in an endless series of philosophical speculation about what is really an empirical question. Even when these factual claims are seen for what they are, they are never empirically examined to determine their factual accuracy and scientific validity. In Piaget words: "all epistemologies refer to psychological factors in their analysis but for the most part their references to psychology are speculative and are not based on psychological research"[108]. Thus Piaget was correct in maintaining that philosophical epistemologies often make empirical claims. This way of characterizing epistemology was similar to Kant. Piaget feels that this should be the task of epistemology and further extended to the study of the constitution of valid knowledge. By constitution of knowledge Piaget, means two related things, namely conditions under which knowledge is attained and the condition that actually make up knowledge.

To determine which conditions actually constitute knowledge is a normative question and therefore, epistemology will be 'especially normative' in character. Empirical questions necessarily arises both in the conditions of

[108] Cf., Jean, Piaget, 'Genetic Epistemology, Normative Epistemology, and Pyschologism', *Synthese*, No. 45, 1980

acquisition and in the constitutive conditions. Since knowledge is a process of acquisition it occurs over time and thus involves a transition from ignorance (lesser knowledge) to (greater) knowledge. Determining the conditions under which this epistemic transition occurs involves the factual questions. An investigation of the conditions constituting knowledge itself involves empirical questions.

The first step towards a scientific epistemology is the abandonment of metaphysical questions. Epistemology pretending to be scientific must avoid wondering at the outset what knowledge is, as this question might involve global metaphysical systems and there is no objective way to decide which metaphysical systems are correct. To become a science, a discipline must initially renounce certain discussion which divide the minds and by convention discuss only those questions that can be dealt with commonly agreed methods. Scientific epistemologists, must forsake metaphysical questions concerning the nature of knowledge, the nature of truth, how knowledge in general is possible etc., and instead focus on the narrower questions, that allow for agreement and that can be answered by scientific means.

The second step to make epistemology scientific is to use the scientific method to answer the epistemological questions. Although the specific nature of this method is not clearly stated by Piaget, this method consists of two inseparable process, namely, that of logical reasoning and deduction and experimental verification (systematic observation) etc. For Piaget, scientific observation is both theory laden and pre-supposes prior conceptual analyses. A scientific method is

understood by Piaget in terms of scientific facts. A scientific fact has three characteristics: it is an answer to a question, it is a verification of experience and it is a sequence of interpretation.

A fact always involves empirical verification, but this is not the "reading off" of experience the empiricists thought it was. Empirical verification always involves a theory or a system of interpretation that structures and makes sense out of experience. There are no incorrigible sense data for Piaget, nor any brute facts. Scientific observations are always theory laden and, as new theories or interpretation arise, our facts may require reinterpretation and reevaluation. In this way, epistemology would be both empirical and conceptual and normative. And one cannot separate the two aspects.

The fact that epistemology can be and must be investigating empirically by using appropriate scientific method met with controversies. Piaget believes that, although such an empirical epistemology employs the scientific method, it will have to focus on the development of knowledge, by using auxiliary methods, namely, the 'genetic method' that attempts to understand the development of knowledge. The feature of genetic epistemology, as the study of the passage from states of lesser knowledge to states of more advanced or superior knowledge characterizes the current philosophy of science.

Reflections on the scope of genetic epistemology have been equally controversial. "Philosophers like Bernard Kaplan, D.W. Hamlyn and Stephen Toulmin believe that genetic epistemology can include only the history of science

(historio-genesis)"[109]. Whereas, Piaget argued for the entire epistemological development of the person (psychogenesis). Kitchener, suggests, that it includes both fields- pyschogenesis and the history of science. This would include the epistemologies of both prehistoric and historic cultures (for e.g. Egypt and Mesopotamia) prior to the rise of Greek Science. This aspect of genetic epistemology would thus overlap with anthropology and ancient history. It would also include the development if epistemic stages prior to the first human beings and/or cultures, for example, the epistemic development of the anthropoids, pre-humaniods and, to a lesser extent, the rest of the animal kingdom.

This follows that all knowledge implies a structure and a function, which only indicates the similarities between the related sciences of anatomy and physiology. In biology, for example, comparative anatomy uses two approaches: it studies homologous structures in mature organisms (for example, the anatomical and evolutionary relations between the fin and the wing and the foot in various spices) and when this method is inadequate, it resorts to embryology, which studies the ontogenetic development of the individual including its anatomical structures. Using this as analogy, Piaget suggests two comparable methods available to a mental comparative anatomy that is genetic epistemology. The method can study the evolutionary and logical relations between certain epistemic elements or categories such as number, space, time, physical quantity in order to map the changes in the structural relations occurring over time up to present scientific thought. This is the historico critical method actually used by

[109] Cf., B.A. Fairell, 'Cognitive Development and Epistemology', Review Works by T.S.Mischel, *Mind New Series*, Vol. 83, No.332 (oct. 1974), PP.629-632

historians as well as philosophers of science. Piaget believes that this method is not sufficient by itself. It has to be supplemented by a mental embryology or psychogenesis, which studies "the genesis of the construction of all the essential notions or categories of thought during the course of the individual's intellectual evolution from birth to adulthood "[110]. This Piaget calls "an embryology of reason".

To sum up, genetic epistemology - a mental comparative anatomy - includes two methods: the historico-critical method and the psychogenetic one. The complete method of genetic epistemology consists of a close collaboration between the historico-critical and the psychogenetic methods.

One of the features of genetic epistemology that it recognizes hierarchy of knowledge claims. Thus there are superior and inferior types or forms of knowledge. The responsibility of judging which is superior and which is inferior lies with that of a specialist. Though this seems to be a unsatisfactory, but unless we have some means of judging what constitutes more stable, or 'better' forms of knowledge, it is difficult to see how 'equilibrium' can be assessed. For Piaget however, this hierarchical notion is present in reality rather than actually judging it. As Piaget points out: "knowing reality means constructing systems of transformations that correspond more or less adequately, to reality. They are more or less isomorphic to transformation of reality. The transformational structures of which knowledge consists are not copies of the transformation of reality. They are simply possible isomorphic models among which experience

[110] Cf., Jean, Piaget, *Genetic Epistemology,* W. W. Norton , New York, 1971.

can enable us to choose. Knowledge, then is a system of transformation that becomes progressively adequate"[111].

Genetic epistemology of Piaget has raised several questions that are both philosophical and conceptual. But the most important question in relation to contemporary philosophy is whether genetic epistemology has normative implication.

At this stage it is appropriate that we compare Piaget's position with that of Quine. The normative character of Piaget's genetic epistemology can be studied with a view to inquire in what sense it is 'naturalized epistemology'. A cursory glance will reveal that genetic epistemology is a species of naturalized epistemology, for it attempts to account for our knowledge, natural and scientific, through an analysis of its growth through biological, and then cognitive developmental structures, because development is a natural process. As discussed in Chapter Five, Piaget's epistemology rejects an epistemology that is normative based upon transcendental and a priori categories. In other words, epistemology is recognized as continuous with psychology and more specifically with developmental psychology.

The 'naturalised' epistemology rejects the aprioristically defined knowledge that can be given to us by our intuitions independent of empirical

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[111] Muriel, Seltman, and Peter, Seltman, *Piaget's Logic- A Critique of Genetic Epistemology,* George Allen and Unwin Publishers, 1985, P. 13

investigations "[112]. Such aprioristically defined knowledge excludes from purview knowledge investigations of psychologists such as knowing how, implicit knowledge or perceptual non propositional knowledge etc. Besides, the normative elements of such knowledge are argued to be irreducible to descriptive terms. The naturalized epistemologist however is accused of circularity.

Quine defends the task of 'epistemologists' of providing a descriptive and naturalistic account of notion of knowledge and other concepts related to it. A naturalized epistemologists according to Quine describes in "behavioral terms (not intentional terms) the relations between an organism and its environment"[113]. And since there exists only causal relations, intentionalist terms such as beliefs etc. have no place in the discourse of naturalized epistemologists. It is obvious from this that traditional questions about the validity of our knowledge (problem of skepticism) has no place. In facts, all doubts, for Quine, are scientific doubts. Transcendental doubts discussed in the classical philosophical texts are irrelevant.

There are three features of Piaget's genetic epistemology that deserve attention while relating to 'naturalized epistemology'. For him, the logical structures studied by logicians are abstract, structural in the formal sense of the term, and consequently cannot be the object of genetic epistemology. Accepting the above mentioned empiricist logical structures and building an epistemology based upon them would lead to the psychologistic fallacy in logic. These logical

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[112] Christopher Hookway, 'Naturalized Epistemology and Epistemic Evaluation', *Inquiry*, No. 37, June 94, pp.465-485.

[113] Cf., J.L. Gibson Jr., The Cambridge Companion to Quine, Cambridge University Press, 2003.

structures that are acquired through series of process of internalization of operations (such as assimilations etc.) are the product of development.

Again, although Piaget rejects the normative element of the notion of knowledge, there is in one sense in which such an element reappears. Piaget accepts that "the knowing subject does not passively receive its knowledge structures. He acts upon them, elaborates and evaluates them"[114]. The third feature, is regarding Piaget's understanding of relationship between the normative conditions of knowledge and the natural world. Piaget does not accept any form of reduction. Responding to Quine's demand that epistemology must be 'naturalized', it is obvious that at least in some sense Piaget's theory of genetic epistemology is naturalized in the sense that it tends to become psychology or biology of knowledge.

Genetic epistemology thus entails normative epistemology, in the sense that 'development' is always development towards some goal (end or telos). As knowing is not merely a descriptive term but one that requires continuous assessment and normative evaluation, it looks as if Piaget is committed to making claims about the normative status of the developmental process. Development is teleological, as it has a goal and in this sense it becomes normative. The different developmental sequences can be graded in terms of their tendency to attain this goal or to approach it in certain kinds of ways (speed, probability, ease, naturalness). The telos or goal of epistemological development is simply assumed

[114] Pascal Engel in *Genetic Epistemology and Naturalised Epistemology* ..... recognizes three senses of 'normativity': one, conceptual necessity, two, evaluative justification and three, meta-level evaluation of evaluations.

to be the normal adult (in the case of psychogenesis) or current science (in the case of the history of science).

Comparing and locating Piaget views with the views of the contemporary thinker K. R. Popper, can be best done by analyzing the positions of Popper and Piaget. Such an analysis would provide us with the two fold framework. To compare Popper and Piaget would amount to arguing for an understanding of consciousness as (a) process that is (b) subject dependent and (c) based upon formation and development of language. In this context, "one would presuppose the understanding of 'subject', both as 'pre-conscious and conscious self'. This also pre-supposes that the subject has a genetic makeup that allows it to 'grow' conscious"[115]. Therefore 'growth of consciousness' can be best understood by analyzing that what goes on from time T1 to time T2, that is, from the time that A does not indicate signs of consciousness and the time A shows that s/he is conscious of his/her surroundings. Philosophical positions of Piaget and Popper provide a two-fold framework. Popper provides justification for the autonomy of consciousness without falling into the dichotomy of dualism. And Piaget provides the 'process' method of understanding consciousness. Put together both provide an articulation of consciousness that is based on development of language. The Popperian- Piagetian perspective is an attempt to understand 'consciousness' and in doing so, avoids the Cartesian (neo-Cartesian) pitfalls by avoiding claim that 'consciousness' is a finished or 'final product' within the ambit of human rationality. Popper interprets the notion of consciousness avoiding all forms of reductionism or physicalism or materialism. Comparing states of consciousness

[115] Cf. A. V. Afonso, *Consciousness, Society and Values,* .....PP. 79-80.

with functioning of machines, he points out that there are very few similarities, but too many differences. The experiences of human beings, Popper states, are irreplaceable unlike the machine and its parts are replaceable. But the one aspect about the human that cannot be replaced is the fact that humans enjoy life, suffers and faces death consciously. Popper considers humans beings as end in themselves and due to this fact the value of humans rises immeasurably. Machines on the other hand are valuable, more so if they are very useful, rare, unique etc., Humans receive their value in spite of their social problems. Popper feels that to take man as machine (doctrine or model) is not only mistaken but also it would lower the dignity of man as 'moral being'. For Popper, "organism chooses its environment and thus man chooses evolution of his brain and mind, by choosing to speak. And this interaction with language has led to emergence of human brain and consciousness of self"[116]. Popper states that though it is difficult to say much about how consciousness emerges, pansychism and behaviorism instead of attempting to explain the phenomenon, avoid the question. Cartesians attribute consciousness to man whereas Popper speaks about lower and higher stages of consciousness. Therefore, "the most reasonable view seems to be that consciousness is an emergent property of animals arising under the pressure of natural selection (and therefore only after evolution of a mechanism of reproduction). In evolution (for materialist) all that is potential or pre-formed becomes actual. But for Popper, evolution has brought into existence of many unforeseeable things, hence creative evolution. It has produced sentient animals

[116] Karl, R. Popper, *Objective Knowledge: An Evolutionary* Approach, Oxford, 1972, PP. 25-26.

with conscious experience "[117]. Popper's notion of creative evolution may be explained in the following way: At a time when there were no other elements in the universe, except hydrogen, helium, etc. Again there was a time when those who had knowledge of operating physical laws could not predict the properties of heavier elements, nor could say that they will emerge. Therefore, we could say that something unforeseeable has emerged. There are stages in the evolutionary process of the universe and that it has produced things, unpredictable and unforeseen at a prior stage.

Popper proposes three world theory, that is, World1 (that is, world of physical objects), World2 (that is, world of subjective experiences 'man' consciousness of self and death and World3 product of human mind and creativity including works of art, and science and technology also human languages, theories of self, and death. Popper explains emergence of World 3 in this way: (a) All living organisms (being material bodies) are subject to all physical and chemical laws. The various processes, forces, fields of forces in the universe interact with living organism. (2) There are also mental states and they are real, real as physical objects in the universe and they too interact with material bodies. Popper talks of an interaction between W1, W2 and W3. The type of relation or interaction between them can be seen in the following: a) Though theories are products of human mind, through their influence on W1, it is a proved that they are autonomous. Popper is a realist believing in reality of theories, as they are capable of exerting their influence. (b) Many embodied objects constitute W3,

[117] Ibid... P. 244.

which is the result of human thought (machines, books, work of art). (c) A scientist is interested in understanding constituents of W1, but makes use of W3 as tools and the result is 'applied science' an autonomous object of W3. (d) For a scientist using W3 as tool, he understand W1 through the intervention of (human grasping capacity) W2. (e) Since there is a typical interaction between W1 and W2 and W3, (e.g.. Learning – capacity to learn is genetic set-up; actual learning is determined by culture, which is W3 object). The interactions between the three Worlds are called as 'psycho-physical interactions'. Popper includes subjective experiences in World 2. It also includes the idea of self, consciousness, etc. Popper accepts the existence of 'self' but carefully avoids questions about self as such questions may lead to essentialism. As he claims that one is not only aware of this self, but also the identity of self in spite of sleep and unconsciousness. Every individual self in World2 experiences the processes of feeling, hopes, fears, enjoyment dreams etc. Others can only infer or guess their occurrences since these processes can only be experienced by that person alone. The self that Popper accepts is linked to the character of personality and thereby changes. It depends in part upon person's physical type and his intellectual imitative and inventiveness. Therefore defines 'person', as psycho-physical process rather than a substance. To learn to be 'selves' Popper advanced 'social theory'. One may sum up the same in the following: In the inborn interest in the human face (first the face of parents) there is beginning of one's learning to be self. This interest leads to understanding of other persons and creates the consciousness of the self in the child. The child uses the people around as the medium, the mirror in which

the child sees the reflection of his own self and other people's consciousness of his self. Thus the child gets the idea of his self through an interaction with the people that he child comes in contact.

For Popper, brain is owned by self and not vice-versa. Self is always active and the only genuine activity we know is the activity of self. Further, Popper has recognized the role of mind rather than believing like David Hume or William James labeling it as 'bundle or stream of experiences'. Popper believes that a huge amount of information obtained through experience is incomparable to the inherited potentialities in the thousand million cells of cerebral cortex - the inborn ability to use the acquired information and knowledge is more important along with the inherited potentialities and knowledge. Popper does not identify 'consciousness' with self as self is continuous and consciousness is interrupted by period of sleep - the unconscious parts of the self - without disturbing the continuity of self. Both self and consciousness are treated by Popper only as processes. But the unconscious part of the self plays an important role in the unity and continuity of the self.

Popper illustrates the unity and continuity and individuality of self with his 'biological approach'. The evolution of consciousness and of conscious intelligent effort (and later on the language of reasoning) should be viewed as teleologically as is the case with evolution of bodily organs which develop for certain purposes and evolve under certain selection pressures. According to Popper, language is first to emerge as it is the basis of the capacity to imagine and to invent. This is the beginning of the emergence of World 3. The speech centre

constitutes the physiological basis for the emergence and development of language which is the highest in the hierarchy of control centers.

Animals and humans are distinguished from the highly organized states of consciousness. Consciousness for Popper emerges before the emergence of language. And the ultimate level of consciousness is attained by a person only when there is emergence and development of language. Popper's W3 is the acquired knowledge and W2 is psychological (subjective experiences) processes. A complete conscious and intelligent work is the interaction between these two worlds. The interaction between W2 and W3 is the result of a fully developed consciousness and pre-supposes language.

Compare the above with that of Piaget position. Normative-epistemology of Piaget "is a theory that includes the claims how a human comes to know the world as a result of the construction of the epistemic structures (that are necessary conditions for knowledge)"[118]. This is the core of Piagetian epistemology. This would answer the question "how we actually know?" Evidence has proved that this construction of Piaget is best available in scientific theory regarding the acquisition of knowledge. Piaget's epistemology is concerned with different set of questions – how epistemology should be done?, how it is related to science?, what methods can and should be employed.? This question when analyzed provides a way for the discussion of Piaget's conception of how genetic epistemology is related to History and Philosophy of Science. Two characteristics of Piaget's genetic epistemology are important to compare Piaget with Popper.

[118] Cf., Muriel Seltman and Peter Seltman, *Piaget's Logic: A Critque of Genetic Epistemology,* George Allen &Unwin, London, 1985

First, Piaget reinforces the idea of 'process' in epistemology. Secondly, Piaget recognizes the need of understanding concepts from 'simple' form to the more complex generic form that we employ today. Piaget's epistemology, as explained earlier, is empirical and verifiable, unlike the traditional epistemology that is normative, speculative and unverifiable. Whereas the traditional (mainly Anglo-Saxon) epistemology is concerned with the nature, scope and conditional of knowledge in general, Piagetian and Popperian epistemology is fundamentally tied up with the growth of science. The Anglo-Saxon epistemologists never accepted any connection between epistemology and science. They were happy with commonsense problems of "elliptical pennies", the look of tomatoes and "bachelors are unmarried males". One can therefore distinguish between pro-science and anti-science epistemologies. Piaget felt that no epistemology can be conducted independent of reflection on science. He therefore, claimed that such anti-science epistemologies are normative, formal and static, whereas his own is descriptive, non-formal and genetic.

The above comparisons does not mean that the two (Popper and Piaget) did not differ. They differed on the use of 'falsificationalism' which Piaget rejected. Further, Piaget believed that one cannot a aprioristically decide whether the problem is scientific or philosophical. There is, in other words, no distinction between scientific and philosophical problems. In fact, all problems are scientific problems for Piaget.

Popperian-Piagetian formulation of epistemology as a process, based upon scientific evidence with recognition of something an aprioristic, provides similar

understanding of consciousness. Consciousness which is central to the epistemic processes comes into existence "by degrees" both for Piaget and Popper. Conscious awareness (of our surroundings) is different from self-consciousness. Consciousness or awareness which we attribute to a child before it has learned to speak is different from self-awareness or the awareness that we attribute to animals with a central nervous system. Something resembling consciousness in some way can probably be attributed to an earlier state of evolution. Both Piaget and Popper to admit that it is unlikely that we ever obtain evidence for or against such a conjecture. But the evidence we have that other people have minds is infinitely better than the evidence we have that animals have minds. But the evolutionary hypothesis seems to force us to attribute lower degrees of consciousness to animals.

Knowledge tied up with activities and trial-cum-error (Popper) and adaptation of organism to environment (Piaget) compel us to recognize the non-formal character of epistemology. Further, the Kantian element in the epistemological framework recognized both by Piaget and Popper, is not factual one. It is uniquely genetic (as Piaget has argued) as reflected in the effort to analyze the structure and activities of cerebral cortex and central nervous system to gain factual information regarding the "act" of cognition and consciousness (as Popper believes). The best way to know this is to study infant from birth (as Piaget would do) or from earlier stage of evolution of consciousness in animals and pre-linguistic child (as Popper would argue).

The minimal consciousness (primitive awareness) and the perceptual awareness (present both in animals and humans) evolve into introspective consciousness or self-consciousness when the individual human being becomes capable of performing an act of self-reflection, reflecting on the contents of one's perceptual awareness. This is the beginning and the essence of cognition. Such capacity presupposes that the individual is capable of giving meaning to the contents of one's perceptual awareness. And this meaning giving capacity is essentially linked to the development of linguistic capacity. It is only when the individual has developed the capacity for language, that one becomes aware of the contents of one's minimal and perceptual consciousness. The development of such a consciousness and consequently cognition is simultaneous with the development of language in humans. It is indeed difficult, as Popper would argue, to carry out a study of how evolutionary processes took place or how animal-like awareness evolves into self-reflective or introspective consciousness. But taking paradigm case study of concepts from 'simple' to more 'complex' generic form that we employ today (as Piaget does), we may hypothesize that consciousness and *mutatis mutandi*, and cognition must have emerged.

Reflections on Piaget and Kuhn will perforce compel us to compare two fundamental concepts: scientific progress and theory of equilibration. There seems to be explicit and implicit acceptance of these two concepts in the epistemological frameworks of the two philosophers. The similarities observed between the two philosophers cannot gloss over the differences, some of which are critical as in the case of Thomas Kuhn conception of progress which is

'discontinuous' as against Piaget's conception which accepts a sort of unidirectional progress.

In the earlier chapters, detailed discussion on scientific progress is carried out. Of particular importance is the similarity between psychogenesis and history of science. Piaget highlighted the fact that like in the case of science there are polygenetic stages, there are in the case of individual, ontogenetic stages. Employing the historico-critical method, Piaget studied the development of various concepts in science. What is the significant about this method is that he conceptualizes it as a history of scientific concepts or categories of thought, a conceptual history that includes the concepts that are necessary for the scientific thought, such as concepts of space, time, causality, quantity, etc. It mainly consists in evaluation the nature, validity, and limitation of scientific concepts, whereas the historical aspect of this method consists on performing this critique by reference to the actual history of science.

As we have seen earlier, scientific progress for Piaget "is possible because of 'increasing equilibration'. Equilibration takes places between the epistemic subject (sic. scientific structures) and the epistemic object or perceived reality"[119]. There are three issues that need attention while comparing Piaget and Kuhn philosophical position regarding scientific progress. First is the understanding of what constitutes continuity. Secondly what type of realism do the two philosophers adopt? Thirdly, what means rationality to both of them.

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[119] Cf., Jean, Piaget, *'Problems of Equilibration'*, In M.H.Appel and L.S.Goldberg(eds), Topics in Cognitive Development, Vol. 1:Equilibration: Theory, Research, and Application, Plenum, New York,

Kuhn's notion of 'scientific progress' "should be understood in terms of his other commitments such as rejection of correspondence theory of truth, rejection of a universal or common criteria for comparing theories and rejection of correspondence between ontology of a theory and its real expression or counterpart on nature"[120]. It is true that Kuhn as a reaction to accusation of relativism asserted that he believed in real 'scientific progress'. The truth however is that Kuhn did not accept scientific development (sic. Scientific progress) as unidirectional and irreversible process. The idea that we could in history of science, improve upon our understanding of nature and that at every stage we would be approximating the truth about the nature does not exist in Kuhnian paradigm of science. He does accept an instrumentalist notion of scientific progress which is definitely unacceptable to philosophers who accept a form of scientific realism.

Comparison between Piaget's notion of scientific progress and that of Kuhn shows that the former's understanding represents science as continuous and cumulative. It is precisely because Kuhn's 'incommensurability thesis' does not account for discontinuity of scientific change that Piaget's more traditional formulation becomes relevant. Kuhn believes that in short time periods (scientific activity during these periods is called 'normal science') science is continuous and cumulative, but when it comes to longer time periods (where scientific 'revolutions' take place) there is neither continuity nor cumulation of knowledge. In fact, Kuhn believes that "in such situations, there occurs, replacement of

[120] Cf., Thomas, Kuhn, *The Structure of The Scientific Revolution*, Chicago University Press, Chicago, 1970.

paradigm either in part or by entirely new ones"[121]. Piaget accepts such discontinuity of scientific progress as he believes that there are discontinuities and even 'ruptures' in the development of science. But there are no rules that govern such 'ruptures'. However, Piaget recognizes some 'internal logic' governing such shifts. "Whenever one paradigm is replaced by another in the process of scientific revolution, it is the result of the process of *assimilation* and *accommodation*, argues Piaget."[122] In short, Piaget argues for more continuous view of science compared to Kuhn. It may however be noted "at this stage that Kuhn in some of later writings expressed reservation regarding the discontinuous and non-cumulative nature of scientific changes"[123].

Comparison between Piaget and Kuhn on their understanding of scientific realism is another important distinguishing mark of common paradigms adopted by the two philosophers. Of course, Piaget has a stronger position in respect to scientific realism that that of Kuhn.

Piaget's realism like contemporary structural realism helps to explain some of the aspects of scientific continuity that Kuhn 'shifts of paradigm' could not explain. Kuhn had been labeled as anti-realist because of his attempt to explain notion of scientific progress without reference to truth and reference. Instead, it is observed that Kuhn appeals to 'success of science' argument for realism based upon an evolution account of science. This does not mean that Kuhn has adopted a realist framework to explain scientific progress. In the

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[121] Ibid...
[122] Cf., Jean, Piaget and R, Garcia, *Psychogenesis and The History of Science* (H. Feider, Trans), Columbia University Press, New York, 1989.
[123] Cf., T, S. Kuhn, *The Road Since Structure: Philosophical Essays,* With an Autobigraphical Interview(J. Conant & J. Haugela, eds.). Chicago, IL: University of Chicago Press, 2000.

resolution of conflict between competing paradigms, the success of one paradigm over the other is explained with reference to the relevant environment in which the paradigms complete, namely the scientific community. This is reflected in the puzzle-solving efficacy of a paradigm over the competing other. Kuhn admits that science evolves and the problems often change, but these changes are non-teleological in nature. Piaget's evolutionary framework, on the other hand is teleological in nature. He accepts a sort of Lamarckian, goal-directed conception of evolution which in ultimate analysis is accept a realist notion of scientific progress. As discussed in detail in Chapter IV, Piaget believes that knowledge reality means constructing systems of transformations that correspond, more or less adequately, to reality. He also believes that knowledge is a system of transformations that become progressive adequate. This seems to render Piaget a sort of experimental realist.

Although Piaget and Kuhn differ on their understanding of realism, both seem to accept the fact that progress is explainable in terms capacity of scientific theories to solve problems. Piaget however lays down one condition for the success, namely, it is the increasing equilibration with constructed structural systems that correspond more adequately to reality. Whereas, Kuhn's condition is that increased puzzle-solving efficacy is not necessarily association with better approximations to reality.

The third aspect of scientific progress that brings together Piaget and Kuhn is the notion of scientific rationality. Whereas Kuhn argues for a non-

rational view of scientific change, Piaget defends a rational understanding of scientific progress based upon his defense of continuity and realism.

Kuhn believes that choice between competing paradigms is not based upon purely 'objective' criterion of appeal to a universal criterion such as 'truth'. Be believes that besides the normal appeal to scientific standards such as accuracy, consistency, scope, simplicity, fruitfulness, etc., there are other subjective standards such as values in our choice of paradigms.

Kuhn 'rationality' of scientific change is identified with 'objective' (or inter subjective) grounds for 'theory choice'. But Kuhn also maintains that insofar as later paradigms are better puzzle-solving instruments, scientific progress can be understood as rational. This is to underscore the fact that 'paradigm choice' is at best and at the highest level dependent on the assent of the relevant community. For Piaget scientific reason does not change without reason, or, *reason evolves rationally.*

Piaget it may be recalled focuses on mechanism of epistemic development; whereas Kuhn was mainly concerned with rationality of scientific change. Piaget's entire philosophy in general and philosophy of science in particular is an attempt to explain the rationality in the development of knowledge and rationality of scientific progress respectively. For Piaget, the rational nature of epistemic development is an axiom. Both the individual epistemic growth and growth of science is rational.

There is however a positive argument why scientific growth is rational. Piaget points out that the general mechanism that explains the rationality of

scientific progress is *equilibration*. Kuhn would admit that theories could be normatively evaluated in terms of more equilibrated and less equilibrated. This seems to be similar to the criteria of 'problem-solving efficacy' laid down to distinguish between competing theories. Rationality for Kuhn under these conditions is instrumental.

For Piaget however, scientific progress is rational as science becomes 'more equilibrated' over a period. Piaget's views on rational differ from Kuhn in the sense that there is not only instrumental rationality (as in puzzle solving) but there is accumulation (or assimilation) of prior theories. The most important feature of this form of rationality is that some theories are recognized as more universal on the basis of their tendency to adequately express the structural characteristics of reality.

One may conclude that in spite of the differences in Piaget and Kuhn's notions of scientific progress, it is important to emphasize the common elements in the two positions such as the emphasis of historical context and the understanding of scientific knowledge as a process. Kuhn and Piaget seem to complementing each other. While Kuhn emphasized the social character of scientific practices, Piaget articulated the mechanism that change less advanced knowledge to more advanced one. Their views together seem to provide a more comprehensive account of scientific change and progress.

Taking into account the non-foundationalist interpretation, one could inquire into the question whether genetic epistemology is at all possible. Several philosophers such as D.W. Hamlyn and Linda S. Siegel have explicitly questioned

the possibility of genetic epistemology. There are others however who upon reflection would be inclined to reject such a possibility. There are several arguments that are leveled against the possibility of genetic epistemology. One of the major arguments to reject the possibility of genetic epistemology is based upon a fact-norm distinction - one example of which is the genesis-justification distinction. Other types of arguments against the possibility of genetic epistemology rely upon a sharp distinction between discovery and justification, a sharp distinction between the conceptual or philosophical and the empirical or scientific or a sharp distinction between the analytic and the synthetic. It is clear that the discovery versus justification distinction needs to be at least re-evaluated and re-interpreted. Similar remarks apply to the distinction between the empirical, that is scientific, and the conceptual that is philosophical. Recent philosophers of science have gone so far s to claim that the philosophy of science is an empirical science. But if we reject that more extreme view, it does not seem clear that one can no longer draw a sharp distinction between the conceptual and the empirical, since the empirical realm seems to be relevant for evaluating the adequacy of conceptual analysis. All of this applies irrespective of the increasing large number of arguments advocating a naturalistic epistemology, the very possibility of which throws the above distinction into question. Finally, a sharp analytic –synthetic distinction is currently no longer widely accepted among the post-Quinean philosophers. Piaget's genetic epistemology is taken to be the paradigm case of a genetic epistemology. This is because Piaget has written more extensively on genetic epistemology than any other individual. Secondly, genetic

epistemology directly tied to the history and philosophy of science and hence constitutes the best example as such. Several other individual like Gardenfore, Harman, Harper, Levi and other also discuss epistemology similar to genetic epistemology, namely, an epistemology concerned with brief revision, probability, kinematics, epistemic dynamics etc. Although the ideas conveyed are similar to a genetic or developmental epistemology, their concern basically seems to be with constructing logical models underlying this process. Piaget's genetic epistemology is concerned with the historical development of knowledge in the individual person. If this is sufficient or whether should include under its scope both the development of knowledge in the individual and in the history of science, is an open question. The answer one could give is that it would include the growth of knowledge in the individual which would include scientific knowledge. Kitchener makes position very explicit when he writes: "At the heart of any such genetic (or better developmental) epistemology would be a concern with the acquisition of knowledge and, in particular, with the epistemic transition from one state of knowledge in the individual to the next. (for reasons that will become clearer later, I wish to separate this conception of genetic epistemology, one which stresses epistemic transitions from a more radical version- naturalistic epistemology-which would replace epistemology by psychology). One of the fundamental supports for the rejection of such an epistemology is the following widely- held principle: questions about the genesis of an idea (belief, concept, theory) is one thing (an empirical question for psychology, sociology or history),

whereas questions about the validity and justification of an idea is a different question (a normative question for logic and epistemology)"[124].

The genesis versus justification distinction results into another kind of dilemma. If genetic epistemology confuses these two points of view and attempts to evaluate epistemic claims on the basis of their historical development, it would be guilty of a (genetic) fallacy and consequently would be impossible. On the other hand, if these two points of views are kept distinct and genetic epistemology is located on the empirical side, then nothing discoverable would be philosophically relevant to a normative question concerning justification. Once again, genetic epistemology would be impossible. What is being ruled out therefore, is the question about the genesis of an idea that has some relevance towards evaluating its epistemic adequacy. According to most of the contemporary philosophers of science, what is characteristic of current post positivist philosophy of science - the views associated with Popper, Imre Lakatos, T. S. Kuhn and Paul K. Fayerabend is the fact that it has taken a historical turn and one insists not only that the history of science is relevant to the philosophy of science, but that actual scientific practice(both historical and current) has some evidential role to play in assessing the adequacy of a philosophy of science.

This point has been articulated in various ways. First, it has been claimed that a scientific theory (paradigm, research, programme) is best constructed not as a logical entity, consisting of a set of temporal proposition but rather as a developmental entity, whose 'nature' unfolds over time in response to its

[124] R, F Kitchner. "Is Genetic Epistemology Possible?', *British Journal of Philosophy of Science,* No .38, 1987, Great Britian, P. 285.

changing background. Hence one must consider the developmental capacities, potential, fertility, etc., of a theory, and this requires an examination of its developmental history. If a scientific theory is the basic epistemic unit in science, then philosophy *qua* epistemology must be a historical or developmental epistemology since an understanding of this epistemic unit must involve an understanding of its historical development.

Secondly, the epistemic evaluation, and appraisal of a scientific theory must also be historical in nature. If we are to evaluate the adequacy of a scientific theory, we need to know answers to questions such as how much evidence at a certain time supports the theory. Notions such as 'ado', 'novelty', 'progressive', 'fertility' as well as questions about growth of science in general, appear to be questions that require historical examination of the particular theory in question and an assessment of its past "track record". Thus 'the carrier of a theory is more important than the formal relations between evidence claims and theoretical postulates at any stage of the theory's history.

Genetic epistemology of Piaget does not commit the genetic fallacy, like the contemporary philosophy of science. Both fields are concerned with the rational genesis rather than with a non-cognitive causal genesis. Such a rational genesis is always subject to epistemic evaluation.

In spite of the above responses, there are several objections raised as to why the very possibility of genetic epistemology remains to be discussed. The most significant ones are: 1) since genetic epistemology is really first genetic epistemology and since psychology is irrelevant to epistemology, genetic

epistemology is thus irrelevant to epistemology. 2) Since genetic epistemology is philosophical, epistemology in which factual questions occur is irrelevant. And since psychology is obviously concerned with these factual questions, genetic psychology is irrelevant to genetic epistemology.

According to a widespread view, psychology is irrelevant to epistemology. The basis for this claim consists of two components. First, the assumption that there is a sharp fact norm distinction and second the claim that psychology is a purely factual science, epistemology is normative in nature.

Genetic epistemology is concerned with advancing a theory and explanation of the growth of knowledge in the individual. Given that there has been epistemic progress, for example, how can one explain this progress? Such an account would be rational reconstruction of the growth of knowledge in the individual, just as philosophy of science provides a rational reconstruction of the growth of knowledge in the collective realm. Genetic epistemological model would be 'tested' against evidence obtained from genetic psychology just as the history of science provides evidence for evaluating philosophy of science. Thus in an important sense, genetic epistemology can be said to make claims about genetic psychology, claims that require checking. Thus both philosophy of science and genetic epistemology make normative claims about epistemic adequacy, justification progress etc. Both attempt to improve one's epistemic conditions and try to facilitate even further epistemic growth. It can therefore, in final analysis, assert that in one specific sense, genetic epistemology is not only

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