CHAPTER TWO

KARL R. POPPER:

EPSEMNOLOGICAL FOUNDATIONS OF INDIVIDUALISM

Karl R. Popper is not the first philosopher to formulate a theory of methodological individualism, but certainly one that proposed an individualism separated from the traditional problems that would lead one to accept a form of psychologism. Popper, therefore, deserves a detailed study of his individualism and hence in this chapter we propose to study Popperian individualism from three different angles. First, we would study the notion of individualism as discussed in Unity of Method. Secondly, we propose to discuss individualism in relation to to historicism, perhaps the strongest 'position' of anti-individualism ever proposed. And thirdly, the study of individualism in relation to a possible reduction to psychologism which Popper vehemently rejects as an impossible task.

We shall begin our study of Popper's individualism with his notion of unity of method. Popper believes that all theoretical sciences whether natural or social make use of the same method. This is not to deny whatever differences may be between the natural sciences and social sciences or between natural sciences themselves and social sciences themselves. Theoretical sociologists all through the history held that the two methods (i.e. the method of natural and social sciences) are fundamentally different. Popper argues for the unity of method. Of course, his method differs from that of Comte, or Mill or Menger, but all of them believe in the fundamental identity of the methods.
The method, what is commonly known as deductive causal explanation (or prediction) is sometimes called hypothetico-deductive method or method of hypothesis (the very expression shows that the method does not give absolute certainty even in the positive sciences). Even after experimentation and testing, when for all practical purposes the hypothesis is verified and established, it retains the character of tentativeness. The hypothetical method is, therefore, a method that proposes a provisional solution relevant to a problem, in the sense that the provisional generalization, laws or theories have ultimately to be replaced by proved ones, (or highly probable ones) in the sense of some calculus of probability. Popper believes that this is the mistaken view of hypothesis as it leads to a number of difficulties. "In science," he believes, "we are always concerned with explanations, predictions and tests, and that the method of testing hypotheses is always the same. From the hypothesis to be tested—for example, a universal law together with some other statements which for this purpose are not considered as problematic—for example, some initial conditions—we deduce some prognosis. We then confront this prognosis, whenever possible, with the results of experimental or other observations. Agreement with them is taken as corroboration of the hypothesis, though not as final proof; clear disagreement is considered as refutation or falsification." 1

Popper next proposes two modes of obtaining theories or hypotheses, i.e., inductive or non-inductive generalizations. (A) In inductive generalizations, we begin with observations and try to derive our theories from them. (B) It is irrelevant for science whether we obtain our theories by inductive procedures or by jumping to unwarranted conclusions or merely stumbling over them, i.e., by some non-inductive procedure.

Popper concludes his analysis saying: "... all this,... is not only true for the natural but also for the social sciences. And in the social sciences it is even more obvious than in the natural sciences that we cannot see and observe our objects before

we have thought about them. For most of the objects of social science, if not all of them, are abstract objects; they are theoretical reconstructions. (Even "the war" or "the army" are abstract concepts, strange as this may sound to some. What is concrete is the many who are killed; or the men and women in uniform, etc.) These objects, these theoretical constructions used to interpret our experience, are the result of construction of certain models (especially of institutions), in order to explain certain experiences—a familiar theoretical method in the natural sciences (where we construct our models of atoms, molecules, solids, liquids, etc.). It is part of the method of explanation by way of reduction, or deduction from hypotheses. Very often we are unaware of the fact that we are operating with hypotheses or theories, and we therefore mistake our theoretical models for concrete things. This is a kind of common mistake which is only too common. The fact that models are often used in this way explains—and by so doing destroys—the doctrines of methodological essentialism. It explains them, for the model is abstract or theoretical in character, and so we are liable to feel that we see it, either within or behind the changing observable events, as a kind of permanent ghost or essence. And it destroys them because the task of social theory is to construct and to analyze our sociological models carefully in descriptive or nominalist terms, that is to say, in terms of individuals, of their attitudes, expectations, relations, etc. — a postulate which may be called 'methodological individualism'.

Popper proceeds to discuss two passages from Prof. F.A. Hayek's Counter-Revolution in Science to prove the above point. Hayek asserts:

The physicist who wishes to understand the problems of the social sciences with the help of an analogy from his own field would have to imagine a world in which he knew by direct observation the inside of the atoms and had neither the possibility of making experiments with lumps of matter nor the opportunity to observe more than the interactions of a

comparatively few atoms during a limited period. From his knowledge of the different kinds of atoms he could combine into larger units and make these models more and more closely reproduce all the features of the few instances in which he was able to observe more complex phenomena. But the laws of the macrocosm which he could derive from his knowledge of the microcosm would always remain "deductive"; they would, because of his limited knowledge of the data of the complex situation, scarcely ever enable him to predict the precise outcome of a particular situation; and he could never verify them by controlled experiment—although they might be disproved by the observation of events which according to his theory are impossible."

Popper observes that *prima facie* it seems that Hayek tries to establish a difference between natural and social sciences. But at the end he clearly asserts both the unity of method and the close similarity between natural and social sciences. Popper further believes that Hayek's description of method in social sciences perfectly agrees with his own method of natural sciences. 1

The second passage that Popper studies from Hayek is: 2

Our knowledge of the principle by which these phenomena are produced will rarely if ever enable us to predict the precise result of any concrete situation. While we can explain the principle on which certain phenomena are produced and confirm this knowledge, exclude the possibility of certain results, e.g., of certain events occurring together, our knowledge will in a sense be only negative, i.e., it will enable us to preclude certain results but not enable us to narrow the range of possibilities sufficiently so that only one remains.

For Popper the above lines perfectly describe the nature of natural sciences. The same applies to social phenomena as well. However, the complexity of a problem does not differentiate the problem a (explanation of social phenomenon) from the 'less complex' and simple problem b (explanation of natural phenomenon). The problem of differentiation arises due to two reasons: (i) What should not be compared has been compared, and (ii) the belief that the description of a social phenomenon involves mental or even physical states of everybody concerned (or perhaps that it should even be

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1. Popper claims that till then he knew nothing of the working models of social sciences such as that of Prof. Hayek. He was exclusively concerned with the natural science models.

reducible to them). Popper maintains that such a belief is unjustifiable. The demand is analogous to asking for description of the atomic states of all elementary particles to explain a concrete chemical reaction. (Popper, however, does accept that chemistry is reducible to physics whereas social phenomena may not be reducible to psychological behaviour of individuals).

"The belief also shows traces of the popular view that social entities such as institutions or associations are concrete natural entities such as crowds of men, rather than abstract models constructed to interpret certain selected abstract relations between individuals." 1 The position somewhat seems to have an anti-individualistic slant, especially regarding the theory of reduction. We shall observe in more details the position at the end of this chapter.

The phenomena of social sciences is, in a sense, less complex than of natural sciences — because in social situations there is an element of rationality, i.e. human beings act more or less rationally and "this makes it possible to reconstruct comparatively simple models of their actions and inter-actions, and to use these models as approximations." 2 This brings us to the conclusion that the difference between natural and social sciences, i.e. the difference regarding their methods, of conducting experiments and application of quantitative methods, is that of degree than that of kind. Popper, therefore, proposes the use of the "zero method" or method of logical construction, "the method of constructing a model on the assumption of the possession of complete information on the part of individuals concerned, and of estimating the deviation of the actual behaviour of people from the model behaviour, using the latter as a kind of zero co-ordinate." 3 He forwards the example of "money illusion" of Marshchak and P. Sargent Florence's comparison between the 'logic of large-scale operation in industry' and the 'illogic of actual operation'

2. Ibid. pp. 140-141.
3. Ibid. p. 141.
to illustrate his statement. But he immediately mentions that "neither the principle of methodological individualism, nor that of the zero method of constructing rational models, implies in (his) opinion the adoption of a psychological method. On the contrary .... these principles can be combined with the view that the social sciences are comparatively independent of psychological assumptions, and that psychology can be treated, not as the basis of all social sciences, but as one social science among others." 1 The difference is in the application of the quantitative method, especially the method of measurement to social sciences. Some of the differences have been already overcome by the application of the statistical method especially demand analysis. He believes that "they have to overcome if, for example, some of the equations of mathematical economics are to provide a basis even of merely qualitative applications; for without such measurement we should often not know whether or not some counteracting influences exceeded an effect calculated in merely qualitative terms. Thus merely qualitative considerations may well be deceptive at times; just as deceptive, to quote Professor Frisch, 'as to say that when a man tries to row a boat forward, the boat will be driven backward because of the pressure exerted by his feet.' But it cannot be doubted that there are some fundamental difficulties here. In physics, for example, the parameters of equations can, in principle, be reduced to a small number of natural constants — reduction which has been successfully carried out in many important cases. This is not so in economics; here the parameters are themselves in the most important cases quickly changing variables. This clearly reduces the significance, interpretability and testing of our measurements." 2

According to Popper, the thesis of unity of scientific method can also be applied to historical sciences. This can be done without giving up the fundamental distinction between theoretical sciences (sociology, economics, politics) and the historical sciences (history of sociology, history of politics, history of economics). The distinction is one between interest in universal...
eral laws and particular facts. Popper argues that "history is characterized by its interest in actual, singular, or specific events, rather than in laws and generalizations." 1

Some historians believe that they have no interest in universal laws - but Popper reprimands them saying that we overlook laws and take them for granted. Among the theories which the political historian presupposes are, of course, certain theories of sociology - the sociology of power, for example. A historian uses these theories without even being aware of them. He uses them not as universal laws which help him to test his specific hypotheses, but as implicit in his terminology. In speaking of governments, actions, empires, he uses usually unconsciously, the 'models' provided by scientific or pre-scientific sociological analysis. 2

Popper next focuses his attention on the situational logic and interpretations of history. Traditional historical explanations emphasize the role of a leader, general, ruler, etc., giving individualistic tones to historical phenomena. Tolstoy's reactions resulted in a combination of individualistic and collectivistic interpretations. Popper nowhere clearly demonstrated his notion of situational logic, outside his lectures. For him situational logic (1) is explanation (2) of human behaviour (3) as attempts to achieve (4) goals or aims (5) with limited means. Consider the three examples I.C. Jarvie 3 uses to illustrate the notion of situational logic.

Example 1: A cautious and blameless driver becomes the cause of a multiple collision. Although the driver is very cautious, he never drove on a free-way (express highways or auto-bahns) where the situation is different from the one normally faces in the streets. The rules of driving on a free-way differ considerably from that of common streets regarding take-over, stopping, changing lanes, etc. Although, X was a very cautious driver, still his cautiousness did him harm by making them the cause of a multiple collision when he

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slowed the car on the fast track to find a gap in traffic to transverse traffic stream.

**Example 2:** A man raises his hat to a lady. Raising the hat to a lady is a gesture of respect which is meaningful only if one understands the social usage of a particular culture. The members of a particular society have accepted certain conventions which give meaning to their seemingly meaningless actions when these actions are not conventions of another society.

**Example 3:** Libya's oil riches erode simple life, although the society has to maintain its traditional harmony. Two factors are responsible for the traditional harmony: Islam, a highly orthodox and conservative religion, and a political form of strong monarchy. Presence of these two factors did not leave the traditional Libyan society from eroding their simple life. The exploration of oil reserves was not intended to bring about a change in the mores of the people. It was meant only to uplift the economic status of their people, but the unwarranted results were a 'natural' consequence of the riches. The example clearly demonstrates the relations between the intended aims and the results is not a necessary one.

The above three examples illustrate how situation determines our actions, behaviour and mores. Popper took up economics for a special study as he believed it to be the most developed social science, to explain the notion of **situational logic**. Fixing of prices in a free market involves **aims**, i.e. maximize profit and minimize loss; a **situation**, i.e. conditions of production, etc.; and finally **means** to achieve the aim, i.e. the economic theory. Popper believed that such theories could be formulated to explain other social phenomena as well, such as the rise of totalitarian governments, breakdown of traditional morals, or prevention or implementation of welfare activities. Such large scale phenomena could be explained by means of the same methodological model that consists of analysis of aims, situation and achievement or non-achievement (factors responsible for the same). Popper calls this type of model 'conspiracy theory of society'. "While conspiracies do exist, by definition they are dedicated to controversial causes, and it is their success in the face of inertia, complexity and opposition that needs explaining . . . . by
reference to the situation. This is an extremely good sociological insight, because most of us take it for granted that an event is explained when a conspiracy to bring it about is uncovered. Popper rightly contends that it is only the beginning; now the success of the conspiracy has to be explained.  

There is, I believe, nothing distinctly new about the 'conspiracy theory' from the traditional sociological theories of Weber and Parsons. What is new, however, is the methodological approach which Watkins clearly defines as individualistic (Popper) and holistic or collectivistic (Weber or Parsons). And it is this issue that we shall try to understand, in what follows.

Jarvie brings up a crucial issue at this stage, namely, whether Popperian analysis of social sciences is normative or empirical. For Popper, although there is a definite demarcation between what would be the normative sciences and the descriptive ones, the theory of 'situational logic' is a perfect integration of the two. Popper's offer of a methodological model of individualism as against holism is a method of problem solving, which is the fundamental tenet in his theory of 'social engineering'.

But the most important aspect of the logic of situation is the analysis of 'good explanations' of the social sciences. Popper's qualification of 'good' is to distinguish an explanation from the so called 'historicism' or 'collectivism' explanation that he believes does not have a 'situation' to which it refers. The seeming historicist phenomena is analysable in reference to individuals and situations. Popper further attempts to furnish a situational analysis of Plato's 'law of the decay of imperfect states' and Marx's 'theory of class struggle'.

The following passage from The Poverty of Historicism clearly demonstrates both the normative and empirical aspects of Popperian 'logic of situation': "We need studies based on methodological individualism, of the social institutions through which ideas may spread and captivate individuals, of the way in which

new traditions may be created, and of the way in which traditions work and break down. In other words, our individualistic and institutionalistic models of such collective entities as models of political situations as well of social movements such as scientific and industrial progress. These models may then be used by historians, partly like the other models, and partly for the purpose of explanation, along with other universal laws they use. But even this would not be enough; it would still not satisfy all those real needs which historicism attempts to satisfy. ¹

Popper's strongest attack is on historicism which regards the above interpretations to be theories. For example, history has been interpreted as 'the history of class struggle' or as 'struggle of races for supremacy' or as 'history of religious ideas' or as 'history of struggle between 'open' and 'closed' society'. These are all, according to Popper, interpretations though quite interesting are objectionable. Historians, however, present their interpretations as theories or doctrines "asserting that 'all history is the history of class struggle', etc. And if they find that their point of view is fertile, and that many facts can be ordered and interpreted in its light, then they mistake this for a confirmation, or even for a proof of their doctrine." ² Different from this view, the classical historians in their attempt to maintain objectivity, try not to be selective and consequently, they adopt points of view without being aware of them. But one cannot be critical of one's point of view without being aware of it. Popper maintains that the only way out of this dilemma would be to adopt "a point of view, plainly, and always remain conscious that it is one among many and that even if it should amount to a theory, it may not be testable." ³

Historicism and Popper's Refutation

Karl Popper opens the book The Poverty of Historicism clearly defining the thesis he is out to defend. He says that "historical destiny is sheer superstition and there can be no

¹ K.R.Popper, The Poverty of Historicism, (1957), pp. 149-150. (The italics are mine).
² Ibid. p. 152.
³ Ibid. p. 152.
prediction of the course of human history by scientific or any other rational methods." ¹ Using his usual 'authoritative' language, Popper claims that "historicism is a poor method - a method that does not bear any fruit," but proceeds to add that he "did not actually refute historicism." ² The whole theory is based on one tenet, i.e. it is impossible to predict the future course of history.

Before we begin with the Popperian refutation of historicism, we shall have to understand the term 'historicism', which by far has been either misinterpreted or inadequately formulated.

The debate of 'historicism' begins with the controversy on the issue of the usage of the term itself. ³ The term has two distinct usages in English: (i) "an attempt to see all the categories of social life and of experience of the individual as belonging essentially to the domain of history which penetrates, whether we will it or not, into all acts," ⁴ and (ii) "the attempt to subsume all the social sciences under history and to take as their principal object the prediction of the future through the assertion of universal historical laws." ⁵

Those who hold the former view believe that "(a) to understand the present, knowledge of the past is essential, ... (b) this past can best be investigated by the process of 'scientific history'.... (c) work which tries to break away from the categories of 'scientific history' whether successfully or not - in the direction of comparative studies is therefore described."⁶

Historicism that we are concerned with in this study is the second meaning, whereby it is regarded as a "theory of social predestination." 1 Popper's use of the term is best summed up in his own words: "It will be enough if I say here that I mean by 'historicism' an approach to the social sciences which assumes that this aim is attainable by discovering the 'rhythms' or 'patterns', the 'laws', or the 'trends' that underlie the evolution of history." 2

Popper's use of the terms was so different from the one used in the social science debates, that Prof. Mayeroff wittily remarked: "To have a target to shoot at, Mr. Popper has set up a false image of historicism. What he has criticized as "the poverty of historicism" is a paradox of historicism. It has nothing to do with the movement of historicism as defined and analysed in the classic work of Friedrich Meineke nor the modern historicism of Dilthey and his successors." 3

Popper's refutation of historicism is summed up in five statements. 1. "The course of human history is strongly influenced by the growth of human knowledge." 4 For Popper this is evident from the observation of the material development of science and scientific ideas.

2. "We cannot predict, by rational or scientific methods, the future growth of our scientific knowledge." 5 The following points, Popper believes, will prove this point.

3. "We cannot, therefore, predict the future course of human history," 6 because for Popper human history is closely related to scientific development et al.

4. Consequently, "we must reject the possibility of theoretical history; that is to say of historical sciences that would correspond to theoretical physics." 7 Popper cannot find any

5. Ibid.
6. Ibid. p. x.
7. Ibid.
any scientific theory that would provide foundation for theoretical historical prediction.

5. Consequently, "the fundamental aim of historicist methods ... is therefore misconceived; and historicism collapses." 1

The above argument does not deny social prediction (prediction based on 'social' or 'economic' theories); it merely denies historicism, i.e. "a position that claims prediction of historical developments to the extent to which they may be influenced by the growth of knowledge," 2 is possible.

Popper regards the second step as the most crucial for argument as "if there is such a thing as growing human knowledge, then we cannot anticipate today what we shall know only tomorrow." 3 The proof of the above thesis is very complicated, but it follows in the following direction: "... no scientific predictor .... can possibly predict by scientific methods, its own future results." 4 In the following pages we shall attempt to explain the above thesis.

The students of methodology concerned with the problems of social sciences try to emulate the feat of natural sciences in their research. And it is these attempts that have resulted in the development of many fields such as psychology. The application of such methods of positive sciences to theoretical social sciences has led to many failures, sometimes total disappointments. Consequently, social scientists tend to distinguish between two types of schools in social sciences in its application to natural science methods to social sciences: (a) pro-naturalistic schools which are regarded as positive schools and (b) anti-naturalistic schools which are negative in approach. Popper points out "whether a student of method upholds anti-naturalistic or pro-naturalistic doctrines, will largely depend on his views about the character of the science under consideration, and about the character of its

1. K.R. Popper, (1957), p.x
2. Ibid.
3. Ibid.
4. Ibid.
subject-matter. But the attitude he adopts will also depend on his views about the methods of physics."  

Popper believes that the mistakes and disappointments are due to 'common misunderstandings of the methods of physics' whose structure the social scientists want to imitate. Popper's basic thesis, i.e. the theory of refutation of historicism can be understood only under the above logical and extra-logical conditions.  

What is historicism? For Popper, historicism is "an approach to social sciences which assumes that historical prediction is their principal aim, and which assumes that this aim is attainable by discovering the 'rhythms' or the 'patterns', the 'laws' or the 'trends' that underlie the evolution of history."  

The anti-naturalistic doctrines of historicism  

Historicism in this field opposes the naturalistic individualism that claims that the social concepts are to be explained in terms of interactions among individuals. The anti-naturalistic historicism regards sociology to be profoundly different from physics and consequently we cannot apply the method of physics to sociology. The reasons forwarded are eleven. First, the physical laws differ from social laws. Second, generalization which is the underlying principle of physics is not so 'general' in social sciences. Third, the physicist has at his disposal the experimental method, i.e. he has artificial controls, isolation, etc. which the social scientist does not. Fourth, in physics there is the sense of novelty which is not so evident in social sciences. Fifth, the formulation of laws, etc. in physics is not so complex as that in social sciences. Sixth, prediction in natural sciences is impossible in social sciences. Seventh, there is also the problem of objectivity and evaluation. In social sciences, the prediction may itself interact to create a change in the phenomenon, and also one cannot have an unbiased study in social sciences unlike in the

2. By extra-logical conditions, I mean those conditions that analyse not merely the logical properties of the arguments in question, but also the actual working of a science in relation to logic of reasoning.  
natural sciences, because the individual social scientist is a product of the society he analyzes. Eighth, most social scientists believe that social sciences unlike natural sciences are holistic and consequently cannot be atomistic. Ninth, very often the understanding gained by a social scientist of a social phenomenon is intuitive rather than experimental, because he cannot carry out a fresh experiment to understand the phenomenon. Tenth, physics employs quantitative methods as against sociology which uses qualitative methods. And finally, eleventh, the issue of essentialism versus nominalism becomes prominent. Essentialists believe in what is the essential separated from the accidentals. The nominalists like to transcend the singles or even sets and look over and above these.

Let us understand the above points of discussion in more details. 1. 'Physical laws' are regarded as valid anywhere and always, i.e. they have no spatio-temporal restriction regarding their applicability, because "the physical world is ruled by a system of physical uniformities, invariable throughout space and time." 1 'Sociological laws' on the other hand differ from place to place and from period to period. "They depend upon history and upon the differences in culture." 2 It is the historical situation that makes sociological laws. Historicians, therefore, affirm that due to the above historical relativity of social laws, it is impossible to apply the methods employed in physics or any other natural science to sociology or social sciences. "Typical historicist arguments on which this view is based concern generalization, experiment, the complexity of social phenomena, the difficulties of exact prediction, and the significance of methodological essentialism," 3 which we shall see in this section.

2. 'Generalization' is the underlying principle of physics, but the principle is regarded useless for sociologists by historicists. Because, "similar circumstances only arise within

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2. Ibid.
a single historical period. They never persist from one period to another. 1 To assume the contrary would be to undermine social developments. The apologetic use of theories that regards 'inevitable laws' as in economics or general inevitability are regarded by historicist as fatalistic. Historicism opposes by maintaining that social uniformities differ in one historical period and another because they are man made, i.e. man has power to alter them.

3. The historicist claims that the physicist experimental (artificial controls, artificial isolation to produce certain effects) methods are not applicable to sociology, etc. The large-scale experiments that are carried out in the social sciences are not to advance knowledge, but for political success.

4. In physics, there is a sense of novelty in laws formulated or phenomena studied, whereas in social sciences there may be at most new understanding.

5. The social science phenomena is complex compared to the phenomena in physical experiments. Two reasons are cited for the complexity of the social phenomena; (a) there is no artificial isolation in case of social facts, which is possible in physical experiments, and (b) it presupposes the mental life of the individual, i.e. psychology, which in turn presupposes biology, which again presupposes chemistry and physics. Since sociology comes last in the hierarchy of the sciences, it shows the complexity of factors involved in social life. Popper claims that 'even if there were immutable sociological uniformities, like the uniformities in the field of physics, we might very well be unable to find them, owing to this twofold complexity. But if we cannot find them, then there is little point in maintaining that they nevertheless exist.' 2

6. If (pro-naturalistic theory) prediction in natural sciences is to be found in social sciences then such a need would be logically impossible, not only very difficult in its actual working. Popper believes that even 'if such a novel kind of scientific social calendar were constructed and became known (it would

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2. Ibid., p.12.
not be kept secret for long since it could in principle be re-
considered by anybody) it would certainly cause actions which
would upset its predictions. 1

7. Prediction in social sciences may interact not only
with other happenings but with the one it predicts. It may either
prevent (the predicted happening or may force its happening) or
cause it. Consequently, doubt arises as to the scientific objec-
tivity of social prediction. Another feature of social science
research is like that of physics, the need of unbiased study. But,
a social scientist being a part of the society to be analysed has
conscious or unconscious bias in his formulation of theories. This
is an extreme relativism, a position taken by historicists to refu-
te any use of scientific method in social sciences.

7. Most historicists believe that (a) sociology like
biological sciences should not proceed in an atomistic manner, and
(b) social groups are not mere aggregates of persons. The example
they forward to prove this point is: "A group founded by A and B
will be different in character from a group consisting of the same
members founded by B and C. This may illustrate what is meant by
saying that a group has a history of its own, and its structure
depends to a great extent on its history. A group can easily
retain its character intact if it loses some of its less important
members, and it is even conceivable that a group may keep much of
its original character even if all of its original members are
replaced by others. All social groups have their own traditions,
their own institutions, their own rituals." 2

Compare this with physical structures such as "conste-
llations" or "solar-systems'. They are 'mere sum of their parts,
together with their geometrical configurations.' Although history
would be very interesting study, the future developments, etc. are
fully determined (given the relative positions, masses and momenta)
by the present constellation of members. 3 Consequently, there is
a close connection between historicism and biological or organic

2. Ibid. p.17.
3. Ibid. p.17.
theory of social structures, 1 - the theory which interprets social groups by analogy with living organisms.

8. Popper's study of methodological doctrine related to historicist position, brings out the following differences between physical and social phenomena.

**Physical**
1. Physics aims at causal explanation.
2. In physics, events are explained rigorously and quantitatively and with the aid of mathematical formulae.
3. Inductive generalization.
4. Arrive at universally valid uniformities and explain events.

**Social**
1. Sociology aims at an understanding of purpose and meaning.
2. In sociology, historical development is understood in more qualitative terms, i.e., as per 'national character', 'spirit of the age', etc.
4. Intuitive understanding of unique events and the role they play in particular situations etc.

Popper distinguishes three different variants of the doctrine of intuitive understanding. In the first position the method of social sciences is regarded "as an imaginative reconstruction of either rational or irrational activities, directed towards certain ends." 2 A social event, therefore, is understood in terms of its analysis of the forces it brought about, i.e., individuals or groups, their purpose, interest, etc. 3 The second variant mentions that imaginative reconstruction of rational/irrational activities directed towards a goal are essential, but it is equally important to understand the meaning and significance of the social phenomena. The third variant accepts the two previous variants besides the necessity of analysing the *reason, effects*, and *situational value of the social event*.

9. Another reason for the historicist position is the claim that physics employs quantitative methods and consequently the natural scientist employs only quantitative terms to describe the natural phenomena. Whereas, the sociologists use qualitative methods and hence employ qualitative terms. The application of

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2. Ibid., p. 21.
3. This variant of intuitive understanding can be regarded same as the teleological explanation that explains social and even natural phenomena in terms of goals, purpose in mind or resulted expected.
quantitative methods by means of mathematical formulae has always been opposed by anti-naturalists. The arguments forwarded by them in this regard are as follows:

How do we explain the success of mathematically-qualitative method employed in social sciences? The historicist would answer that there is still a difference between the mathematically-deductive method employed in physics and statistical method of social sciences. The sociological method cannot be compared to mathematically formulated causal laws of physics. Popper sums up the historicist argument in the following words: "..... it is the sociologist's task to give a causal explanation of the changes undergone, in the course of history, by such social entities as, for instance, of economic systems, or forms of government. As there is no known way of expressing in quantitative terms the qualities of these entities, no qualitative laws can be formulated. Thus, the causal laws of the social sciences, supposing that there are any, must differ widely in character from those of physics, being qualitative rather than quantitative and mathematical. If sociological laws determine the degree of anything, they will do so in very vague terms, and will permit, at the best a very rough scaling ... it appears that qualities — whether physical or non-physical — can only be appraised by intuition."  

10. The problem of qualitative character of sociological methodology leads us to another problem, namely, problem of universals, probably the oldest of the philosophical problems. The issue for us in this present study is however, the use of the terms such as (a) 'energy', 'velocity', 'whiteness', 'justice', 'state', 'humanity', etc. which differ from such terms as (b) 'Alexander the Great', 'Hayley's Comet', etc. which are considered as proper names, "labels attached by convention to individual things denoted by them."  

The terms employed in (a) differ from those employed in (b) so long as (b) applies to a single thing (i.e. individual) and (a) applies to the members of a set or class of single things.

2. Ibid. p.27.
For example, whiteness is equal to swans, snowflakes, table-clothes, etc. This doctrine is traditionally known as nominalism as opposed to realism, which Popper calls essentialism.

The essentialists believe that it is not the case that we collect a group of a single things and call them "white", but we call each single thing "white" on account of certain intrinsic property that it shares with other white things, namely, "whiteness". Realists on the other hand believe that the 'real' exists over and above a single thing or a set or groups of single thing. Essentialists not only believe in the existence of essent- tials but stress their importance for science. Science must strip away the accidentals and penetrate to the essence of things. But the essence of anything is always something universal.

These considerations would lead to serious methodological implications. But we can consider, at present, methodological issues independently of metaphysical ones if we discuss merely the ends and means of science. 1

The methodological essentialist demands that scientific research must penetrate the essence of things. The methodological essentialist in answering to questions such as 'what is force?' or 'what is justice?' would succeed in establishing the real essence of things - nature which is the prerequisite of scientific research. The methodological nominalist on the other hand, would answer to questions such as 'how does this piece of matter work?' or 'how does it move in the presence of bodies?' by explaining how things work and this is done by "freely introducing new terms if necessary or by re-defining old terms. For words are merely useful instruments of description." 2

Methodological nominalism has been victorious in natural sciences such as physics, chemistry, etc. even to a great extent in biological sciences. Consequently, the methodological naturalists will favour nominalism and methodological anti-naturalists will favour methodological essentialism. Hence, "while

2. Ibid, p.29.
the methods of the natural sciences are fundamentally non-naturalistic, social sciences must adopt a methodological essentialism.\(^1\) This is the historicist position, according to Popper.

To sum up the above discussion of anti-naturalistic doctrines of historicism, we can distinguish two types of doctrines: (a) doctrines about subject matter and (b) about the method. The naturalistic doctrines regarding subject matter assume that laws of nature are valid for all times and places. Further, their occurring once does not obviate them from occurring again. Historicist claim that laws that hold for society in one period do not hold for another is untenable for the naturalist. Although social situations may repeat themselves, no two social situations can ever be the same because the opinions and memory about the past effect the actions of the participating individuals. Hence, unlike natural situations, social ones may be radically novel.\(^2\)

Secondly, historicists believe that physical structures or 'natural wholes' are no more than the 'sum of their parts, together with their geometrical configurations.' According to historicists, a social group cannot be specified, as a planetary system, can be, by listing and describing, for some specified date, its numbers, and all the personal relations that obtain between them. Whereas, a whole like a planetary system can be explained 'atomistically' by means of physical laws, their relative positions, mass and moments, changes in a social 'whole' have to be explained 'holistically'. The historicist, therefore, distinguishes between genuine wholes and atomistic 'heaps', the distinction Popper claims to be 'exceedingly vague'. Alan Donagan points out that 'vagueness' cannot be considered 'irremediable', and moreover, the historicist has to explain these wholes historically. This historicist position, Popper calls 'principle of holism'.

Thirdly, the historicists claim that even if naturalism were true, the complexity of social science subject matter would make the application of naturalistic methods impracticable. For instance, in the case of solar system, there are very few laws of

\(^1\) Alan Donagan calls this historicist doctrine, the principle of radical novelty.

of forces by which we could compute with exactitude the deviations caused in the planet's orbit by varying gravitational fields through which it passes. Although, few large-scale natural processes can be calculated with a high degree of precision, the social processes are comparatively more complex than the most complex natural processes.

The naturalistic doctrines regarding the method, claim that generalizations in the social sciences cannot apply to all historical periods. This position follows from the first anti-naturalistic historian tenet, namely, laws that hold for society for one period do not hold for another.

Secondly, the anti-naturalist historian claim that significant artificial experiments, unlike natural sciences, are rarely if ever possible in social sciences is because of two reasons: First, social sciences exhibit radical novelty, and second, the discovery of changes in artificially isolated parts is irrelevant to the problem of explaining group processes.

Thirdly, predictions in social sciences are inexact, as the social scientists cannot use the methods of prediction used in physics, etc.

Fourthly, predictions in social sciences are impure, as they have a twofold function: theoretical and practical. Prediction in social sciences serves to bring about or prevent the predicted phenomenon. Popper observed that "most historians have marked tendencies towards 'activism'". ¹

And finally, the historian claim, according to Popper, that the quantitative and mathematical methods of social analyses cannot help in formulating laws of social change. The historians' doctrines regarding the method employed, assume both implicitly and explicitly that the methods of natural sciences are different from those of social sciences at least in some respects, and hence they become Popper's targets for criticism. Popper added to this, the problem of essentialism and the traditional realism with the

view of perfecting his doctrine of historicism. There is, however, considerable doubt as to whether the two positions are outcomes of historicism, as Popper claimed.

The Pro-Naturalistic Doctrines

Historicism is not opposed to the idea that there is a common element in the methods of the physical and social sciences. Because, like physics, sociology too aims at the theoretical and empirical. Theoretical, because like natural sciences, sociology explains and predicts events with the help of theories and universal laws. It is also empirical because, (a) the conclusions are based on experience, (b) the events it explains and predicts are observable facts and (c) observation is the basis of acceptance or rejection of a theory.

The difference lies in our understanding the term success. "When we speak of success in physics we have in mind the success of its prediction, and the success of predictions can be said to be the same as the empirical corroboration of the laws of physics. When we construct the relative success of sociology with that of physics, we are assuming that success in sociology would likewise consist, basically, in corroboration of predictions. It follows that certain methods — prediction with the help of laws, and the testing of laws by observation — must be common to physics and sociology." ²

1. It is accepted that in astronomy we predict future events such as eclipses which are long term predictions. Why we cannot predict social events such as popular revolutions or the rise of new social groups, etc? However strong may be our belief in science, it is logically impossible to have Sociological Almanack (À la Nautical Almanack). The difficulties are due to the complexity of sociological phenomena, and consequently, social predictions suffer from vagueness, etc., which Popper calls "predictions on the large-scale" or "large-scale forecasts".

2. History (in the narrow sense) is an empirical basis of sociology (like astronomy) because it is only from the recorded data available to us that we can justifiably predict an event. The historicist position goes even further to claim that history is the only empirical source of sociology. Hence, the forecasts of sociology must also be of an historical character.

3. Celestial mechanics (astronomical theory) is based on dynamics, "the theory of motions as determined by forces; Statics is an abstraction to explain how and why (under certain conditions) change does not occur. "Dynamics deals ... with forces equal or unequal, and might be described as the theory of how and why something does happen. Thus, only dynamics can give us the real, universally valid laws of mechanics; for nature is process; it moves, changes, develops — although sometimes only slowly, so that some developments may be difficult to observe." 1 Historians would apply the method of dynamics to sociology and may even go further to say that like dynamics sociology is a causal theory which always has an historical element. The typical example would be that of any accident and its explanation.

4. For the historicist, sociology is a theoretical history, and its scientific forecasts must be based on historical laws. The problem arises when we accept that there are social laws and at the same time the historicist denies ordinary generalizations in sociology. How can we have genuine social laws? The only universally valid laws of society must be laws which link up the successive periods. Hence, only laws of historical development can be formulated, claim the historicists.

There is another very important feature that will distinguish the historicist from the anti-historicist, i.e. the acceptance of either of the predictions. There are two types of prophecies: (i) mere prophecy and (ii) technological prediction, a kind of basis for engineering. For example, the prediction of a typhoon-hit can be understood (i) as mere warning that would help people of the area to move to safer places and (ii) a prediction that helps

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the populace to prepare themselves to a tycoon hit and face it by means of building houses the type that would stand against any disaster, etc. The historicism believes that sociological experiments are quite useless and impossible. They claim that it is social prophecy rather than social engineering that is the aim of social sciences. It is the historical forces that control social development. (There are a few historicists who would try to reconcile with the notion of social engineering).

6. The fundamental dogma of the historicist is that social science is nothing but history. History for historicist is not only a chronicle of historical facts but also a science that looks forward. For him, a sociologist must (a) try to get a general idea of the broad trends in accordance with which social structures change, and (b) try to understand the cause of this process, the working of the forces for change.

Fopper's position regarding pro-naturalistic doctrines of historicism can be summed up in the following: First, social sciences are, like natural sciences, empirical as they elaborate their hypotheses by means of empirical verification of their deductive development. Secondly, like natural sciences, they also have a theoretical function to perform, namely, to explain and predict social situations by discovering universal laws.

Historicists, however, claim that social sciences are theoretical in a different sense from that of natural sciences are theoretical. Hence, they do not accept J.S. Mill contention that social sciences rest on naturalistic individual psychology. Further, they also deny that social sciences have their own experimental techniques, etc. and that they are independent of natural sciences. The source of empirical evidence in the social sciences is history and therefore the historicists conclude that 'sociology is theoretical history'.

Regarding prediction, the historicists contend that given historical initial conditions, historical predictions could be deduced. They further claim that as prediction in social sciences are not precise, i.e., there is a margin of uncertainty, it is scientifically redundant to have quantitative predictions in social sciences. As a result, the only scientifically useful predictions
would be quantitative ones that have long-term value or what Popper calls 'long-term forecasts'.

The claim that social scientists can attempt large-scale forecasts on the basis of qualitative historical laws, is prima facie, unacceptable with the assumption of 'radical novelty'. Popper claims that the above naturalist and historicist dilemmas can be solved by calling in laws of historical development. The problem, however, remains, i.e., how could the historicists formulate laws of development on the basis of historical evidence, which is the only evidence they accept? Popper believes that there cannot be such laws.

We have so far discussed the two views, i.e., the naturalist and the anti-naturalist position of Popperian analysis. It would be our task presently to see whether either of the views is acceptable or whether they are reconcilable.

Popper begins his criticism by laying down his aims at criticising the naturalist view. Although he defends the rights of 'pure' or 'fundamental' research without which science would not develop, he still believes that scientific speculation and analysis has been and is centered around the practical problems and tests for the progress of sciences. In biological sciences for instance, it is the need to solve human problems such as sickness, etc., that led to the whole development in genetics, medicine, etc. The same applies also to social sciences whose guiding source of inquiry into "methods of social research, and more especially into the methods of the generalizing or theoretical social sciences," has been the need of practical solution to the problems of 'society'. As a solution to this practical task of the study of social sciences, many have advocated the use of historicist method, by which one could transform the society. This practical aim of social sciences is the meeting point or ground for the great controversy between historicists and anti-historicists. Popper believes that historicism is a poor method to yield the promised results.

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1. 'Large-scale forecasts' are different from 'long-term forecasts' such as astronomical prediction which are exact and have little scope for social significance.

Popper's refutation of historicism depends upon his own theory of 'piecemeal technology' or 'piecemeal social engineering' which is in his theory of social change. The development of social sciences is largely due to criticisms of social policies, i.e., of attempts made by either economists, politicians and others to solve some social problems. Popper regards this type of method as a classical one in comparison with his own 'piecemeal engineering.' He warns not to misunderstand him on this point. The need of solving practical problems does not mean that the theoretical problems are not cared for. Popper has positively argued for the discussion and analysis of the theoretical problems which is the only way of solving the social problems. It would help us in selecting the problems, as it imposes a discipline on our speculative inclinations (which, especially in the field of sociology proper, are liable to lead us into the region of metaphysics; for it forces us to submit our theories to definite standards, such as standards of clarity and practical stability."

1. What Popper rejects is, like Hayek, extreme form of naturalism which he calls "dogmatic naturalism." 2

To begin with Popper dissolves the seeming objection regarding the theory of interventionism. The prima facie objection is that the technological approach adopts the activist attitude which goes against the anti-interventionist or passivist view — "the view that if we are dissatisfied with existing social or economic conditions, it is because we do not understand how they work and why active intervention could only make matters worse." 3 Popper believes that anti-interventionism is untenable "even on purely logical grounds since its supporters are bound to recommend political intervention aimed at preventing intervention." 4

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2. "Dogmatic naturalism" is in the same Prof. Hayek's "scientism" which believes in a 'mechanical and uncritical application of habits of thoughts to fields different from those in which they have been formed.'
4. Ibid., p.61.
Criticism of Holism

Popper begins his criticism of holism by analysing the term 'whole'. It is used: (a) "to denote the totality of all properties or aspects of a thing, and especially of all the relations holding between its constituent parts,"¹ (b) to denote certain "special properties or aspects of any thing in question, namely those which make it appear an organized structure rather than a 'mere heap'."² A typical example of (b) is the study of Gestalt psychology and formulation of theories.

The fact that wholes as in (b) can be studied does not mean that wholes as in (a) can be studied in like manner, because if we wish to study a particular thing H, we are bound to select some one aspect of it. For example, the study of physical body K is presupposed in the study of the organism's movement from one place to another. Hence, wholes as in sense (a) can "never be the object of any activity, scientific or otherwise."³

The historicist position suffers from the same inadequacies as the holist of the type (a). Historicist holists believe that they can tackle the wholes considered as totalities. The difficulty lies in the understanding of history, according to Popper. The problem is that historicists combine "the correct belief that history, as opposed to the theoretical sciences, is interested in concrete individual events and in individual personalities rather than in abstract general laws, with the mistaken belief that 'concrete' individual in which history is interested can be identified with 'concrete' wholes in sense (a)."⁴ This is impossible to achieve because history deals with the "selected aspects of the object in which it is interested."⁵ Hence, one cannot accept that there is a history in the holistic sense, like a history of 'states of society' which represent 'the whole of the social organism', or 'all the social and historical events of an epoch.'⁶

2. Ibid.
3. Ibid., p.77.
4. Ibid., p.80.
5. Ibid.
6. Cf. Ibid., p.81.
Popper proceeds to point out that even the 'whole' in the sense (b) is unacceptable because of its triviality and vagueness. The definition of 'whole' as more than sum of its parts is seldom realized. For example, Popper analyses the example of 'three apples in a plate' to prove his point. The claim of 'more than its parts' can be made "in so far as there ... (are) certain relations between them (the apples) (the biggest may or may not lie between the others, etc.); relations which do not follow from the fact that there are three apples, and which can be studied scientifically." ¹ Popper even rejects the alleged opposition between the 'atomistic' and 'gestalt method', because even in atomic physics what is studied is not merely the configurations of different particles but "particle systems from a point of view most definitely concerned with wholes in sense (b). What most of the Gestalt theorists apparently wish to assert is the existence of two kinds of things, 'heaps' in which we cannot discern any order, and 'wholes' in which an order or symmetry or a regularity or a system or a structural plan may be found." ²

Popper sums up the triviality by pointing out that even to claim that "organisms are wholes" reduces itself to triviality, "that in an organism we can discern some order. Besides, a so-called 'heap', as a rule, has a Gestalt aspect too, just as much as the often cited example of the electrical field (consider the regular manner in which the pressure increases within a heap of stones). Thus the distinction is not only trivial, but exceedingly vague; and is not applicable to different kinds of things, but merely to different aspects of the same thing." ³

The next issue in question is the variability of the experimental conditions. Popper holds that the historicist belief that "the variability of historical conditions renders the experimental method inapplicable to the problems of society, or ... the study of society is fundamentally different from the study of nature" ⁴ is implausible. It is different to say that in practice

¹ R. Popper, (1956), p.82.
² Ibid., p.83.
³ Ibid.
⁴ Ibid., p.96.
it is difficult to vary the experimental conditions of a social phenomena and claiming that it is a priori impossible. Even the physicist suffers from the same difficulty in the natural sciences. For example, it is difficult to vary the gravitational fields or extreme temperatures in the physical experiments. Besides, there were cases which even in the recent past were considered as in practice impossible to vary the experimental conditions and now we can. Many such physical investigations are successfully completed which were considered as impossible. The social sciences which are in most cases in their fundamental stages of development compared to natural sciences cannot be expected to be as precise natural sciences. As Popper affirms: "... many experiments which would be most desirable will remain dreams for a long time to come, inspite of the fact that they are not of Utopian but of a piecemeal character. In practice, he must rely too often on experiments carried out under conditions, and in a manner, which have much to be desired from the scientific point of view." 4

The historicists believe that in social sciences the "validity of all generalisations, or at least of the most important ones, is confined to the concrete historical period in which the relevant observations are made." 2 Popper, although does not question generalisations as such, forwards a critical theory. He claims that it is the wrong assumption to believe that the regularities observed in everyday life are "social laws". But the social scientists observe that such "social laws" which are acceptable in their own societies are not acceptable in some other and even in their own in another period, i.e. "there may be many regularities in our society which are characteristic of our particular period only, and that we are inclined to overlook this limitation." 3 But would even agree to this situation. But the historicist goes even further to say that such a "situation creates difficulties which do not occur in the material sciences; and more particularly that, in contrast to the natural sciences, in the social sciences we must never assume that we have discovered a truly universal law, since

2. Ibid. p.98.
3. Ibid. p.99.
we can never know whether it always held good in the past (for our records may be insufficient), or whether it always held good in future." Popper holds that the above mentioned situation is neither peculiar to social sciences nor does it create any undue difficulties. He asserts that "a change in our physical environment may give rise to experiences which are quite analogous to those which arise from a change in our social or historical environment." 

Popper forwards the example of succession of day and night and the environmental change that occurs once we cross the polar circle when the succession breaks down.

Another relevant criticism that Popper forwards is regarding the method of reduction, causal explanation and prediction. For him, causal explanation means that a certain event is explained by "deducing a statement describing this event from two kinds of premises: from some universal laws, and from some singular or specific statements which we may call the specific initial conditions." 

Popperian explanation consists of (a) universal statements (the same as natural laws) and (b) specific statements (describing the special case in the specific event), which are also called initial conditions. He believes that from the universal statements (a), we can deduce with the help of singular statements (b), a third statement (prognosis) which is regarded as the effect in relation to the singular statements or initial conditions which are regarded as the cause of the specific event. Popper does forewarn that "such a causal explanation will ... be scientifically acceptable only if the universal laws are well tested and corroborated, and if we have also some independent evidence in favour of the cause, i.e. of the initial conditions." 

Such a theory of explanation has a few restrictions: (a) we cannot speak of cause and effect in an absolute way. We can speak of A being the cause of B the effect, only in relation to a universal law, and (b) predicting some specific event is just another aspect of the use of theory of explaining an event.

2. Ibid. p. 101.
3. Ibid. p. 125.
4. Ibid. p. 124.
Popper further asserts that since a theory is tested by observing the predicted phenomena or events, the analysis of explanation also shows how a theory is to be tested. Again, the causal explanation of regularity described by the universal law is different from a general statement made to describe a singular event. Prima facie the two cases look similar. In a universal law, the initial conditions should be explicitly stated, for otherwise, the universal law may contradict the special condition/s of the specific event. Popper takes the example of Newton's theory of the solar system. He says, if "we wish to explain the law that all planets move in ellipses then we have to put first explicitly in the formulation of this law the conditions under which we can assert its validity, perhaps in the form: If a number of planets, sufficiently spaced to make their mutual attraction very small, move round a much heavier sun, then, each moves approximately in an ellipse with the sun in the one focus."  

Popper's arguments, whether against historicism or pro-unity of method or non-acceptance of psychologism, raise a large number of issues both individually and collectively. In analysing his arguments against historicism, we shall depend to a large extent on critical studies carried out by Peter Urbach, 2 Alan Donagan, 3 and A. Olding. 4

Peter Urbach's analysis of Popper's arguments consists of an attempt to refute the principle of Unity of Method and further to suggest some restrictions on research in social sciences. He analyses 'four' Popperian arguments to refute him (Popper). Popper claimed that "the search for the law of the 'unvarying order' in evolution cannot possibly fall within the scope of scientific method, whether in biology or in sociology ... The evolution of life on earth, or of human society, is a unique historical process. Such a

process we may assume, proceeds in accordance with all kinds of causal laws, for example, the laws of mechanics, of chemistry, of heredity and segregation, of natural selection, etc. Its description, however, is not a law, but only a singular historical statement. Universal laws make assertions concerning some unvarying order, i.e., concerning all occurrences of a certain kind; and although there is no reason why the observation of one single instance should not incite us to formulate a universal law, nor why, if we are lucky, we should not even hit upon the truth, it is clear that any law, formulated in this or any other way, must be tested by new instances before it can be taken seriously by science. But we cannot hope to test a universal hypothesis nor to find a natural law acceptable to science if we are forever confined to the observation of one unique process.” 1 Popper seems to claim that the historical law has the form (x)Ex, where x ranges over complete evolutionary sequences, and if the universe of discourse contains just one element, then the historicist law is untestable, consequently, unscientific. Two fundamental objections immediately crop up. First, we could claim that the evolutionary process is not a unique process, and that we could observe the same process in different societies. Secondly, even if we accept that the evolutionary process is a unique one, we could still formulate a hypothesis on the basis of a ‘trend’ or ‘direction’ or ‘tendency’ which could be tested by future experience.

Urbach analyses the answer Popper gives to these two objects. First, Popper contends that history sometimes repeats itself in certain respects, but claims that the circumstances under which it repeats itself are ‘vastly dissimilar’. "We have, therefore, no valid reason," argues Popper, "to expect of any apparent repetition of an historical development that it will continue to run parallel to its prototype." 2 Popper seems to claim that we cannot validly infer the historicist theory from observation of particular historical development. But this does not necessarily follow that historicist theories must be untestable.

2. Ibid., p.111.
For Popper would surely not reject a theory on the ground that it is not proved from facts. As Urbach points out, "the egregious feature of his philosophy is that the credit is given to just those theories which transcend the given facts and are testable as possible."  

The answer to the second objection is rejection, on the basis of the distinction between a law and a trend. Popper claims that "while we may base scientific predictions on laws, we cannot (as every cautious statistician knows) base them merely on the existence of trends. A trend.... which has persisted for hundreds of years may change within a decade, or even more rapidly than that." Urbach refutes Popper by citing Suchting: "Statisticians, such as actuaries, sufficiently cautious to make large profits for insurance companies, do predict on the basis of trends." It can be further stated that if, as Popper believes, a trend which has persisted for hundred years or more may change within a decade or even more rapidly and consequently the 'theory' formed on the basis of such a trend may be false, the "argument merely repeats the triviality that universal historical theories cannot be logically inferred from statements describing trends." Hence, there does not seem to be any further proof so as to claim that historicist theories are unscientific or untestable.

Urbach reduced the whole argument to the problem of statistical validity. If we are to understand Popper correctly, it suffices to say at this stage, that he has little regard to statistical laws which in Hempelian language are "half-way generalizations".

The second Popperian argument can be called "falsity of historicists laws." The main thesis of the argument assumes that ".... although we may assume that any actual succession of phenomena

4. Ibid., p. 120.
proceeds according to the laws of nature, it is important to realize that practically no sequence of, say, three or more causally connected concrete events proceeds according to any single law of nature. If the wind shakes a tree and Newton's apple falls to the ground, nobody will deny that these events can be described in terms of causal laws. But there is no single law, such as that of gravity, nor even a single definite set of laws, to describe the actual or concrete succession of causally connected events; apart from gravity, we should have to consider the laws explaining wind pressure; the jerking movements of the branch; the tension in the apple's stalk; the bruise suffered by the apple on impact; all of which is succeeded by chemical processes resulting from bruise, etc. The idea that any concrete sequence or succession of events (apart from such examples as the movement of a pendulum or a solar system) can be described or explained by any one law is simply mistaken. There is neither laws of succession, nor laws of evolution." ¹ Urbaeih, in trying to understand Popper's second argument, points out that a 'set of laws can explain the succession of events of Newton's apple' ² What probably Popper wanted to assert, is that a 'set of laws alone cannot explain the events' using only a set of universal laws. But the historicists do not explain events using only a set of universal laws. The historicist laws as laws of succession or laws of evolution are substitution instances of the following: "All human social formations of type T pass through stages described by $S_1$, $S_2$, ..., $S_n$ in a given temporal order." ³

Urbach claims that in assuming that no concrete sequence of events can be described or explained by any set of laws, ⁴ Popper misconstrues his defence. For, "if, by 'law', we understood as a conjectural universal theory because we can always construct a

⁴ Popper does accept a few minor exception which he encountered in physics - but does not explain why they are present.
universal statement one of whose consequences, in the presence of suitable initial conditions, describes, a given sequence of events. And we do not know whether this theory will be independently confirmed, nor will any amount of a priori cogitation tell us. But perhaps Popper intends to deny any single law, que true universal statement can explain any given, concrete sequence of historical events. But if so, it is difficult to see what would justify this denial. Popper seems to assume that if a sequence of events is determined by initial conditions and a set of (true) laws, then there can be no single law (true universal statement) which describes that sequence. But this is not correct.

We have so far studied the logical implications of Popperian argument that historicist process being a unique process cannot be scientific. Popper identifies historicist laws and the laws of evolution and claims that as there cannot be a law of evolution, there cannot be historicist laws. In Popper’s words:

I believe that the answer to this question (Can there be a law of evolution?) must be ‘No’, and that the search for the law of ‘unvarying order’ in evolution cannot possibly fall within the scope of scientific method, whether in biology or sociology. My reasons are very simple. The evolution of life on earth or of human society, is a unique historical process. Such a process, we may assume, proceeds in accordance with all kinds of causal laws, for example the laws of mechanics, of chemistry, of heredity. Its description, however, is not a law, but only a singular historical statement. Universal laws make assertions concerning some unvarying order, as Huxley puts it, i.e. concerning all processes of certain kind; although there is no reason why the observations of one single instance should not incite us to formulate a universal law, nor why, if we are lucky, we should not even hit upon the truth, it is clear that any law formulated in this or in any other way must be tested by new instances before it can be taken seriously by science. The most careful observation of one developing caterpillar will not help us to predict its transformation into a butterfly. As applied to the history of human society — and it is with this we are mainly concerned here — our argument has been formulated by R.A. Fisher in these words: Men ... have discerned in history a plot, a rhythm, a predetermined pattern ... I can see only one emergency following another ... only one great fact with respect to which, since it is unique there can be no generalisation.

The argument simply means that as evolution of life on earth is just one unique process, its description is not a universal law because a law has to be tested by new instances. Evolutionary 'law' or description is a singular historical statement. Olding formulates an ontological interpretation of Popper's argument. Prof. A. Olding begins with the study of Suchting's epistemic interpretation of Popper's argument. According to epistemic interpretation, Popper's argument assumes that "the proponent of evolutionary laws mistakes a singular statement of an evolutionary sequence for a law which requires a universal statement for its expression." And if he insists that such a singular statement is a universal law, then it cannot be a scientific law, because scientific laws require multiple instances as testing possibilities. Suchting argues that Popper's argument may deny the existence of scientific laws of historical development and not laws of development in general.

Whether Popper really meant what Suchting interprets is a different consideration. But as an interpretation, it does question the validity of Popper's argument. Suchting points out that it does not follow from the fact that there is only one instance of something that we cannot formulate statements about it which allow for a 'multiplicity of testing possibilities'. Because, statements of scientific laws are hypotheticals, i.e. \( x \rightarrow y \), and as such are true even if both \( x \) and \( y \) do not exist. For example, 'the number of possible proteins is much greater than the number of proteins that have ever existed.' Such laws might have been empirical consequences such as "by entailing, in conjunction with other statements, that certain breakdown products of this protein would have such and such properties - the breakdown products might be synthesised and their properties ascertained."

Suchting concludes saying that if we can formulate laws for non-existent things, then we should be able to formulate laws:

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3. By scientific laws, Popper assumes twofold qualification, (a) they should be empirical and (b) falsifiable.
for things that exist but once.

Olding, in his own ontological interpretation of Popper’s argument, concentrates on the term ‘unique’ which Popper uses to describe ‘historical sequences’. There are many ways in which the term ‘unique’ can be used, as for instance the phenomenon or process is not governed by law. Olding assumes that “perfectly law-abiding events may have unique spatio-temporal coordinates.” ¹ Uniqueness of evolutionary processes, i.e. it only happens once, is not a matter of logic, for one can imagine repetition of history or the evolutionary process, but a ‘factual uniqueness’. ²

Popper forwards two arguments to assert the factual uniqueness of evolutionary processes. Popper gives the example of Newton’s apple ³ and proceeds to point out that there can be no single law or definite set of laws to explain the concrete sequence or succession — hence there are no laws of succession or evolution. The fallacy of Popper’s argument lies in his assumption that “any concrete sequence or succession of events ... can be described or explained by any one law, or by any definite set of laws.” ⁴ Olding considers stars not in their courses but in their sequences. “Stars have their histories. Main sequence stars of which the sun is a middle-aged member, regularly go through the same evolutionary development, eventually to reach the same end as collapsed dark bodies; and stars with other stateable initial qualities go through different, but predictable, phases to reach more or less spectacular ends. All this can be depicted on Hertzsprung-Russell diagram and can be expressed as different laws of succession. It is clear that there is no question here of the law of succession of main sequence of stars somehow riding roughshod over the laws of gravity, thermodynamics, etc. Given that there is a body of matter of a certain kind, with a certain density and volume, then gravitational forces will bring about its contraction which in turn fire off a nuclear reaction and so on. With falling applies,

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2. Cf. P. Urbach’s discussion of this example in MPS, Vol.29, p.179 for a fuller discussion.
the laws of nature work to produce a higgledy-piggledy succession of events; with stars they result in laws or succession."  

Olding further points out how Popper's argument begs the question. In an attempt to refute those who believe that the evolutionary sequence is not unique, Popper considers "one such position and speedily dispenses of it and leaves us to assume that this now vanquished alternative to his own view is the only possible one - or, at least, that it can stand in as a fair representative, or at the best, of all possible alternatives." 2

The second argument of Popper against the laws of succession consists in ruling out all the possibility of evolutionary laws on the basis of 'apples falling on a windy day.' Olding rightly argues that the refutation of the argument against the evolutionary laws does not necessarily conclude that such laws are descriptions. Because, "the evolutionary sequence of organic forms is quite different from the evolutionary sequence of stellar states or, even the development of sequences of individual organisms." 3 For instance, we do not seem to observe any 'master plan' in the process of evolution, as we observe in the 'unfolding' of an individual organism, which depends on the genetic code. For example, the different metabolic processes can be explained by the different physical and chemical laws together with the description of appropriate initial conditions. 'All Mose die before reaching the age of fifty' is probably one such statement for Popper, which he considers is strictly universal statement but of accidental character. It does not have the character of true universal law of nature. Hence, for Popper, "the characterization of laws of nature as strictly universal statements is logically insufficient and intuitively inadequate." 4 If by this Popper claims that the 'universal and necessary' statement of the historical type would fail in some or all possible worlds which differ from our own with respect to initial conditions, then in Urbach's

2. Ibid., p.138.
3. Ibid.
view, Popper does not ipso facto deny the scientific character of historicist laws. If such was not the case then even Kepler's laws would be merely accidental generalities in Popperian language.

Urbach tries to understand an alternative explanation of the Popperian assumption. He says "for suppose that a historicist truly proposes that every society in this world proceeds through a certain sequence of states, $S_1, ..., S_n$, in the given temporal order. Now even if every instance of $S_1, ..., S_n$ is determined by a set of initial conditions (I) which is realised at the beginning of the universe and a set of physically necessary laws ($I_1$) it is logically possible for the same sequence of states to occur in the same temporal order in every other world which differs if at all with respect to (the $I_1$)"

Consequently, historicist theories are on par with theories in physics, etc.

Again, Popper will have to explain the issue of certain exceptions that he accepts while formulating the thesis. Popper has forwarded no argument to claim that there is a basic difference between such systems (for instance, movement of pendulum or solar system) and the human societies or institutions.

The third argument is regarding 'scientific prediction'. Popper contends that "a trend, as opposed to law, must not in general be used as a basis of scientific predictions." He believes that the historicist fallacy lies in the fact that trends depend on initial conditions, and they (historicists) employ these trends as if they were unconditional, i.e. laws. This confusion between laws and trends is the central mistake of historicism, claims Popper. However, 'absolute trends' are unconditional and hence like laws, do not depend on initial conditions. The "laws of development" turn out to be absolute trends, trends, which like laws, do not depend on initial conditions, and which carry us irresistibly in a certain direction into future. They are the basis of unconditional prophecies, as opposed to

3. Ibid., p.125.
conditional scientific (sic) predictions. "" Briefly, Popper claims that there are two types of prophecies or predictions: (a) unconditional prophecy which is unscientific and historicism which operates with prophecies of this type, and (b) conditional predictions which are scientific. Popper's distinction between prophecy and scientific or technological prediction warrants a 'The coming of typhoon' is a prophecy and 'if a certain shelter is to stand a typhoon, it must be constructed in a certain way, for instance with ferroconcrete buttresses on its north side' is a typical technological prediction, according to Popper. 2

The crucial distinction seems to be that in case of prophecy we can do nothing to prevent, whereas in technological prediction, we can control the events or achieve certain results on the basis of engineering. It is clear, therefore, that the logical structure of the two types of predictions is the same, i.e. they are derived from laws and initial conditions. Urbach rightly points out that the Popperian distinction brings out nothing unscientific about prophecies of the type (a). Popper, however, suggests that the former (prophecies) are unscientific when he distinguishes between 'prophecies' and 'scientific predictions'. Urbach cites Popper to solve the terminological confusion: 3

"... long term prophecies can be derived from scientific conditional predictions only if they apply to systems which can be described as well-isolated, stationary and recurrent. These systems are very rare in nature, and modern society is surely not one of them.

The terms 'well-isolated', 'stationary' and 'recurrent' are insignificant so long as Popper does not point out what are the influences from which a system is isolated or with respect to what properties the system is considered to be stationary and recurrent. Urbach argues that "the solar system is (according to current theories) approximately stationary with regard mechanical

energy and angular momentum and recurrent with respect to the position and momentum of its constituent planets, and it is well-isolated from certain specified possible influences on these positions and momenta. But with respect to many chemical and biological properties (for example, the number of human beings), it is not recurrent; nor is it well-isolated from some external influences (for example, star light) on these properties. Human societies are also well-isolated and recurrent in some respect, but not in others. Whether human societies are well-isolated with respect to influences which would make all historicist theories false, is implausible; more importantly it is precisely the point at issue in the argument over historicism and cannot be decided by any amount of a priori cogitation. Nothing in Popper's arguments, so far considered, decides this central question either way. 1

Regarding Popper basic argument against historicism, (i.e. 'the course of human history is strongly influenced by the growth of human knowledge' and 'we cannot predict the future course of human history', because, 'we cannot predict ... the future growth of our scientific knowledge', 2) Urbach points out that "the fact that each of a sequence of events is strongly influenced by unpredictable occurrences is compatible with the existence of regularities - arising by accident, as it were - in the sequence." 3 Boyle's law of gases is an apt example of this type of 'regularities' where we predict the general features (pressures and volume) of a sequence of states of interacting particles, none of which can be predicted individually.

Urbach further adds that it could be in principle, impossible to predict micro-events, but this does not affect the truth of macro-laws. He concludes saying that the supressed assumption is not true. However, the logical falsity of the 'supressed assumption' could be 'a highly plausible assumption about the world', i.e. we could assume that the appearance of a reasonably

2. A detailed exposition of this argument is available on p.60 of the present study.
simple 'historicalist law', strongly influenced by the unpredictable events and hence with such small probability, would be impossible. We can accept the thesis as a good anti-historicist argument, but it is no logical argument to disprove or weaken historicism. The anti-Popperian position is due to two facts: (a) the probability of any law statement is rather small and historicist theories would therefore be no more improbable than any law statement in the physical sciences", 1 and (b) "there are reliable and well attested macro laws in physics which, like the historicist laws, relate broad features of a system while the more fundamental parts of that system are (perhaps in principle) unpredictable." 2

Another hidden assumption of the above argument is that 'a predictor cannot predict its own future discoveries'. Popper's argument consists in showing that no single scientific predictor can predict its own future results and "attempts to do so can attain their result only after the event, when it is too late for prediction; they can attain their result only after the prediction has turned into a retrodiction." 3 Popper at this stage seems to be confusing between what we call 'scientific prediction' and 'prediction' as an unverified hypothesis.

We shall end this section with Urbach's words: "I have reviewed Popper's attempts to demolish 'historicism' and lay down special restriction on the predictive power of the social sciences. I conclude that none of Popper's arguments is valid, and that, therefore, the principle of the unity of natural and social sciences is unimpeached by these arguments." 4

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2. Ibid.
**Rejection of Psychologism**

In this third section on Popper we shall analyse notion of psychologism and understand why Popper rejects it. Psychologism started as a reaction to idealistic Hegelianism. What is psychologism? Social scientists have often raised the question whether it is the groups or society or social collectivities that are the ultimate and real constituents or it is the individuals and individuals only that are real. Malinowski for instance believes that it is the individuals that are the real constituents of the social action or interaction and the 'group' merely refers to an "assemblage of individuals".†

The issue at hand is whether the terms employed by sociologists, and other social scientists are merely names given to individuals belonging to, or having similar characteristics or not. Professor Warriner 2 argues that such a nominalistic doctrine finds itself most favourable in a "mechanistic type of psychological theory." 3 Whatever may be the confusion created by the term, he together with many other philosophers of social science like Professor Stark, 4 hold that groups are not real, it is the individuals that are real. Jacob Friedrich Fries and Friedrich Beneke advocated a similar position based entirely on psychology. They believed that "the only instrument of philosophical inquiry has at its disposal self-observation (or introspection) and that there is no way to establish any truth other than by reducing it to the subjective elements of self-observation." 5 This makes psychology the fundamental discipline reducing logic, ethics, and other disciplines to the status of applied psychology. As Beneke pointed out: "... with all the concepts of philosophical disciplines, only what is formed in the human soul according to

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2 Ibid.
3 Ibid. p.2
4 Ibid. p.3
the laws of its development can be thought: if these laws are understood with certainty and clarity, then a certain and clear knowledge of those disciplines is likewise achieved."

The attempts of Fries and Beneke were to integrate the philosophical speculations of Kant and the psychological experiments of Jacobi. So long as Kant emphasized the need of experience in human knowledge, he was acceptable but he did not stop there – he upheld the supremacy of a priori basis of knowledge when he tried to propose the transcendental method by which categories were deduced. Both Fries and Beneke regarded this as impossible, because for them the critique of reason can enter in the science of experience based solely on observation. The middle of the nineteenth century saw a great revival of psychologism with the appearance of J.S. Mill's *A System of Logic*.

A defence of Kant has been very strongly and systematically proposed by R.H. Lotze. Lotze distinguished between the psychological act of thinking and the content of thought. The former, he believed, is merely a temporal phenomenon whereas the latter has the property of validity.

Analogical defence has been also proposed by Gottlob Frege in relation to mathematics. Frege pleads "never to take a description of the origin of an idea for a definition, or an account of the mental and physical conditions through which we become conscious of a proposition for a proof of it. A proposition may be thought, and again it may be true; never confuse these two things. We must remind ourselves, it seems, that a proposition no more ceases to exist when I shut my eyes."

A psychologistic position could not rest content – it came under renewed attack from neo-Kantians of the last decades.

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2. Cf. Ibid., p. 524.
3. Mill claims that it is only by introspection that one can come to the knowledge of axioms of mathematics or the principles of logic which are the only indisputable tenets in every day experience.
5. Ibid.
of the nineteenth century. Chief among them were Windelband, Rickert of Barden School, Cohen and Natrop of Marburg School, who claimed that values are independent of psychological experience, "which could never establish their absoluteness and necessity" and also claimed that "the validity of science ... does not depend on psychological conditions but on the laws proper to these sciences - that is, on the methodological rules which govern their construction." 1

It was with Husserl that a systematic refutation of psychologism was attempted. Husserl could not understand how we could deny the following conclusions if we accept that logical laws are based on psychological laws, because then (1) "logical laws ought to be like the psychological laws, vague and approximate, whereas, at least in part, they are so exact that they cannot be guaranteed by an empirical element; (2) ... based, like empirical laws, on induction which yields only a probable and not the apodictic certainty they manifest; (3) ... imply the existence of such psychic events as representation and judgment, whereas they do not concern the reality of psychic life and of other facts (like the laws of nature, which are merely probable) but concern necessary relation independently of facts." 2 With this historical background let us understand the Popperian notion of psychologism and why he rejects it.

Karl Popper discusses psychologism in relation to his theory of epistemology. For example he says that the issue of psychologism came up with his discussion with Heinrich Gomperz 3 who proposed, criticised and reaccepted psychologism. For Popper, the acceptance of the world real and its discovery was the primary issue. He says that "if we want to argue about (the existence of real world), it, we cannot start from our sense experiences (or even from our feelings as his (Gomperz) theory demanded) without falling into the traps of psychologism, idealism, positivism,

3. Heinrich Gomperz is author of Weltanschauungslehre, which is a thesis on theory of feelings. He was a close friend and guide to young Popper during his University years.
phenomenalism, even solipsism, all views which I refused to take seriously." It is immediately evident from the above, that Popper recognized the problem of psychologism only in relation to epistemic issues rather than ontic ones, and further 'psychologism' is on par with other philosophical positions such as idealism, positivism, phenomenalism and even solipsism.

He further says that the psychological positions of Locke, Berkeley and Hume (generally labeled as association psychology) were the result of the application of Aristotelian logic to psychological terms. Consequently, Popper was convinced that it was more important to study logic of knowledge rather than the subjective thought processes. He became even suspicious of the classical psychological theories of his time, such as 'conditioned reflex', etc.

To understand Popper's strong reaction to psychology, we must understand Popperian logic of knowledge. He sums up his argument in *Logic der Forschung* in the following:

In the initial stage, the act of conceiving or inventing a theory, seems to me neither to call for logical analysis nor to be susceptible of it. The question how it happens that a new idea occurs to man — whether it is a musical theme, a dramatic conflict, or a scientific theory — may be of great interest to empirical psychology; but it is irrelevant to the logical analysis of scientific knowledge. This latter is concerned not with questions of fact (Kant's *quid factiti*), but only with questions of justification or validity (Kant's *quid juris*) ......

Accordingly I shall distinguish sharply between the process of conceiving a new idea, and the method and results of examining it logically. As to the task of the logic of knowledge — in contradistinction to the psychology of knowledge — I shall proceed on the assumption that it consists solely in investigating the methods employed in those systematic tests to which every new idea must be subjected if it is to be seriously entertained.

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2. Popper interpreted Pavlov's experiment with dogs as a search for invariants in trying to acquire food, which is a 'trial-and-error' process. And as such creates expectations, or anticipations of what is to be achieved. He calls this 'conditioning instant reflex but which implies 'learning process'.

Some might object that it would be more to the purpose to regard it as a business of epistemology to produce what has been called a 'rational reconstruction' of the steps that have led the scientist to the discovery — to the finding of some new truth. But the question is: what, precisely, do we want to reconstruct? If it is the process involved in the stimulation and release of an inspiration which are to be reconstructed, then I should refuse to take it as the task of the logic of knowledge. Such processes are the concern of empirical psychology but hardly of logic. It is another matter if we want to reconstruct rationally the subsequent tests whereby the inspiration may be discovered to be discovery, or become known to be knowledge. In so far as the scientist critically judges, alters or rejects his own inspiration we may, if we like to regard the methodological analysis undertaken here as a kind of 'rational reconstruction' of the corresponding thought processes. But this reconstruction would not describe these processes as they actually happen; it can give only a logical skeleton of the procedure of testing. Still this is perhaps all that is meant by those who speak of a rational reconstruction of the ways in which we gain knowledge.

Popper's epistemic beliefs, we can observe from the above passage, have two important tenets important for our present discussion, i.e., the logic of scientific knowledge, which is not the same thing as psychology and second, the nonpsychological doctrine which is the 'empirical basis' of science.

The first issue is discussed in the first part of Logik der Forschung where he claims that the logic of knowledge is concerned only with logical relations. In the 'Elimination of Psychology', Popper argues that 'psychology of knowledge', i.e., "... the act of conceiving or inventing a theory seems ... neither to call for logical analysis nor to be susceptible to it." ¹ His main concern is to analyse and evaluate scientific theories once they are formulated. Consequently, he distinguishes between logical analysis of the contribution to science from the psychological analysis of the inventor or scientist. He believes that scientists analyse and evaluate theories independently of personal or psychological facts about the scientists who produced or invented the concerned theories. This is in contrast with the traditional empiricists who explained knowledge in terms of or with reference to the perceptual experiences of the knower. As Musgrave points out: "... perceptual experiences justified or established perception or observation statements - the rest of science could be

'known' only insofar as it would be logically inferred (deductively or, more often inductively) from justified perception or observation statements." ¹ Popper, to steer clear of subjectivism that 'night' result in, from such a position, insists that statements can be justified only by other statements and the truth of an observation statement cannot be established by appealing to the psychological fact that you have had certain perceptual experiences and that these experiences have made you feel sure that the observation statement is true.

It is clear that in Popperian epistemology, 'truth' is not established by experience. The truth or falsity of an experimental statement depends upon the agreement among the community of scientists. As Popper puts it: "I admit ... that the decision to accept a basic statement, and to be satisfied with it, is causally connected with our experiences – especially with our perceptual experiences. But we do not attempt to justify basic statements by these experiences. Experiences can motivate decision, and hence an acceptance or rejection of a statement, but a basic statement cannot be justified by them – no more than thumping the table." ² Hence, Popper's 'empirical basis' is radically different from the traditional empiricists who believed in finding empirical evidence or 'justification' for their statements.

Popper, like David Hume, believes that inductive arguments from the empirical statements cannot be valid. Because, for Popper, "all empirical statements are fallible, none can be justified or established as true. His 'empirical basis' plays only a critical role – valid deductive arguments can lead from components of his (fallible) empirical basis to the negations of those systems of hypotheses which exclude these components. But even experimental criticism in science is fallible, since the premises from which it proceeds are fallible." ³

This is briefly, Popperian position regarding the rejection of traditional epistemological doctrine which is 'inclined' towards subjectivism. As a positive contribution, Popper tries to point out to the objective or non-psychological properties of scientific knowledge so as to establish objective standards of knowledge. In more precise terms, Popper's contribution to the philosophy of science issues has been the 'hypothetic-deductive analysis of explanation'. Popper's method of scientific explanation, which consists of statements that can be classified as explanandum and explanans, and they have the following logical relations: (a) the explanandum is deducible from the explanans; (b) high empirical content or independent testability of the explanans; and (c) truth of the explanans. These are objective standards laid down by Popper which do not, according to him, contain any personal or psychological criterion of its analysis.

In contrast with this, a subjective or psychological explanation as proposed by Percy Bridgman consists of "reducing a situation to elements with which we are so familiar that we accept them as a matter of course, so that our curiosity rests". Alan Musgrave points out to the following form in Bridgman's formulation: "A explain B (to person X) if A removes (X's) feelings of complexity or puzzlement concerning B, then rendering B unproblematic (to X)." Now the fact that such an explanation tries to remove the feelings of puzzlement does not necessarily mean to be subjective. However, this is not a necessary condition of an objective explanation. And if we are interested in the growth and development of scientific knowledge, then explanation in the purely objective terms is a must, because scientific explanation is autonomous, impersonal and consequently objective. We are aware of many an alleged scientific explanation which assumes a common-sense notion of explanation as in the case with Bridgman, who claims that to explain means to reduce unknown or unfamiliar to known or familiar.

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This is not to deny the subjective dimension of explanations. Problems do have both subjective and objective dimensions, but it is the latter that is paramount to scientific progress.

Another issue worth considering at this stage is the notion of 'simplicity' in science. Popper believes that simplicity is not merely subjective — as applying his analysis of falsifiability, one may make a less simple theory more acceptable than the more simple one.

Another important feature of Popperian epistemology is that the logical or objective approach to knowledge depends upon the objectivity of logical relations like deductibility or contradictoriness. The subjectivists opted for psychological relations rather than the logical ones. For example the principle of contradiction was accepted on the basis that it is impossible to simultaneously believe both p and ~p. Of course, such positions do not anymore feature in any logic of knowledge or epistemology.

The last feature of Popperian logic of knowledge consists of the theory of verisimilitude, a claim that every false statement has true logical consequences. It is by this that we can say that one false theory is nearer to truth or has greater truth-content compared to another false theory. As Musgrave points out: "It allows us also to solder the two fundamental aims of science, truth and high content, into one: high verisimilitude. And in the light of this single aim we can say that a false theory may be better than a true one simply because the former, though false, has greater verisimilitude than the latter." 4

To sum up the above discussion, Popper's logic of scientific discovery attempts to lay down aims and standards by means of which we can not only create but also evaluate the scientific theories. Popper further lays down a methodology, i.e., methodological rules designed to achieve these aims and standards, which consists of (i) high explanatory power or

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empirical content, (ii) testability of the scientific theories.

Now, the issue is whether the 'methodological rules' thus formulated have to be applied by the scientists, free from psychological considerations. If we are to succeed in the criterion laid down by Popper, it is necessary that the scientists should be 'critical minds' and undogmatic, for the strict application of Popperian methodology. Can we have such 'critical minds'?

Popper's rejection of psychologism suffers from various assumptions which are not always non-psychological. He demands, in several places that a scientist should make a sincere attempt to overthrow the theory in question, which for him is the severe test of a theory. Further, he demands that there must be a 'critical attitude' among the scientists in their attempt to formulate and verify their theories. Despite of many a defence we would consider, there are clear psychological presuppositions or recommendations in the very use of the term. Musgrave points out to this fact when he analyses the problem of severity of tests, which is paramount in Popper's philosophy of science as "the degree of corroboration of a hypothesis depends upon the severity of the tests to which it has been subjected." ¹ Popper, however, immediately points out after defining the degree of corroboration, that one cannot completely formalise the idea of a sincere and ingenious attempt (to refute a hypothesis).²

Speaking of the degree of corroboration of a hypothesis which depends upon the sincerity with which a test is devised and performed, Popper clearly seems to be on the psychological plane rather than the logical. For example he says:³

... I must insist that C(h,e) can be interpreted as degree of corroboration only if e is a report on the severest tests we have been able to design. It is this point that marks the difference between the attitude of the inductivist, or verificationist, and my own attitude. The inductivist or verificationist wants affirmation for his hypothesis. He wants to make it firmer by his evidence e ... In opposition to this inductivist attitude, I assert that

3. Ibid., p.418.
G(h,e) must not be interpreted as degree of corroboration of h by e, unless e reports the results of our sincere efforts to overthrow h. The requirement of sincerity cannot be formalized... Let if e is not a report about the results of our sincere attempts to overthrow h, then we shall simply deceive ourselves if we think we can interpret G(h,e) as degree of corroboration, or anything like it.

This leads us to believe that Popper's requirement of severity of tests and sincerity of the tester for a scientific explanation is a necessary presupposition of any adequate explanation. And if such is the case, then a psychological report about the tester is a must for the logic of knowledge. Popper, however, tries to forward another analysis, namely, objective analysis of severity of tests, in an effort to isolate the subjectivist criterion. Musgrave describes the objective analysis thus: The intuitive idea behind this objective analysis is that the more unlikely or unexpected (in the light of what we already know, our 'background knowledge' h) is a prediction p from a hypothesis h, then the more severe will be the test of h provided by testing p. Thus, for example, if we can predict from h a 'new effect' (that is, something completely unexpected in the light of h), then testing this prediction will constitute a severe test of h. Or, the more precise the prediction p, the more severe can be a test of it, since a more precise prediction is less likely to be true, given h, than a less precise one. 1

It is true that Popper does attempt to emphasize the objectivity of his analysis to avoid the stigma of subjectivism. It, however, remains unexplained how else could one defend the requirement of sincerity in a severe test of a hypothesis. Musgrave and other 'Popperians' seem to accept Popper's assurance as the final word in this regard.

Musgrave attempts another argument to prove the objectivity of Popper's 'severe test'. He says that sincerity on the part of the experimenter is not a sufficient condition of a severe test. As we could still have very sincere critic who nevertheless cannot produce any severe test. It seems then that

sincerity is a necessary condition of a severe test, and this is an empirical issue. Musgrave holds that the very fact that we can formulate an empirical question, (i.e. can we conclude that whenever a test is severe, the attempt is a sincere one on the part of the tester?) follows that there must be an independent test to confirm the severity of the tests.

But, it is possible that a not so sincere tester formulates a severe test, and consequently, the presence of a severe test does not necessarily imply that the tester is sincere. Consequently, sincerity is neither the necessary nor the sufficient condition to produce severe tests. Musgrave, however, claims that "appeals to the sincerity of testers can be dispensed with entirely in favour of Popper's objective analysis of severity of tests." 4 But he immediately adds a restriction, namely, he accepts that Popper's 'objective' analysis does not contain all the important aspects of tests being severe. He claims that the 'objective analysis' as proposed by Popper is 'bare bones' and as Popper himself admits, that "there remains an unformalizable residue, consisting of things, the conceptual and perceptual inadequacy of the experiment or the care taken to exclude interfering factors." 2 Popper does emphasize and assert, time and again that 'sincerity' as a test of severity is not a psychological criterion, but an objective analysis. But fails to explain how it could be non-psychological or objective criterion devoid of all mental or psychological determinants on the part of the tester.

Musgrave makes one serious point in his study of Popper's rejection of psychologism. He claims that the requirement of 'sincerity' which was a Popperian reaction to Marxism, psychoanalysis and Adlerian psychology, makes it "easy to find verification for a theory if we are keen in finding it, is not very satisfactory. Because, "a theory can lack genuine confirmations without lacking sincere critics; a theory which does not yield any precise and improbable predictions, cannot be severely tested, no matter how sincere its critics may be. A better response to this problem

5. Ibid.
is to point out that easy 'confirmations' are usually spurious ones, not because they are consciously sought after, but because they do not result from severe tests in the objective sense of that term."  

Briefly, 'psychologism' affirms that all theories of social sciences will be reduced to psychological behaviour; it does not necessarily affirm that the theories of society have no subject matter of their own and that the so-called groups are unreal. Even some forms of methodological individualism accept that their thesis does not go against the possibility of groups being real. Even J. S. Mill and Auguste Comte believed that the so-called social laws are reducible to laws of human nature, but not without difficulties.

Popper finds a 'solution' to this intriguing problem. He demands that we should find (a) conditions of progress and also the conditions under which progress could be arrested; (b) this immediately leads to the realization that psychological propensity alone cannot be sufficient to explain progress, since conditions may be found on which it may depend; and (c) therefore, replace the theory of psychological propensity by institutional (and technological) analysis of the conditions of progress. It is therefore necessary that we understand such 'social' phenomena as closing down of institutions (social) as language, laboratories, journals, etc.

Consequently, Popper concludes saying that scientific objectivity based to some extent on social institutions and not on the mental or psychological attitude of the individual scientist. Popper, however, will have to answer how one understands a social phenomenon without any study of the individuals that interact in the social situation. There seems to be a total volte face in Popperian analysis at this point.

Popper has another argument in defence of his anti-psychologism or non-reductionism of social phenomena to psychological one. He says psychology being one of the social sciences

cannot be the basis of social sciences. Because "human nature" varies considerably with the social institutions, and its study therefore, presupposes an understanding of these institutions. Further, he believes that as social sciences are by and large concerned with the unintended consequences or results of human actions, "which may violate all interests of the social agent, whether conscious or unconscious; although some people may claim that a liking for mountains and solitude may be explained psychologically, the fact, that if too many people like the mountains, they cannot enjoy the solitude there, is not a psychological fact; but this kind of problem is at the very root of social theory." 2

Popper, therefore, disagrees with Mill and Comte and "instead of reducing sociological considerations to the apparently firm basis of the psychology of human nature, we might say that the human factor is the ultimately uncertain and wayward element in social life and in all social institutions." 3 For Popper this human factor can never be completely controlled, and an attempt to control it would lead to believe in the "omnipotence of the human factor - the whims of a few men, or even of one." 4

The next issue is whether science could control the human factor. There is no doubt, according to Popper, that biology and psychology can solve, or will be able to solve, the 'problem of transforming man'. But he argues that "those who attempt to do this are bound to destroy the objectivity of science, and so science itself, since these are both based upon free competition of thought; that is, upon freedom. If the growth of reason is to continue, and human rationality to survive, then the diversity of individuals and their opinions, aims and purposes must never be interfered with (except in extreme cases where political freedom is endangered). Even the emotionally satisfying appeal for a common purpose, however excellent is an appeal to abandon all

2. Ibid.
3. Ibid.
4. Ibid.
rival moral opinions and the cross-criticism and arguments to which they give rise. It is an appeal to abandon rational thought." 4

Popper's rejection of 'reduction' arises from his thesis of three worlds. Bolzano distinguishes between truths in themselves or statements in themselves and the thought processes by which a man may think or grasp the truth. Statements in themselves 'stand in logical relations' to one another, whereas, subjective thought processes stand in 'psychological relations', according to Bolzano. On the basis of the above distinction, Popper points out that one's thought processes do not contradict that of another; it is the content of the thought processes that can contradict. Again, contents or statements in themselves do not stand in psychological relations. He, therefore, concludes that the two (thoughts in the sense of contents or statements in themselves and thoughts in the sense of processes) belong to different worlds.

Popper distinguishes three different 'worlds' and points out to various relations between them which apparently do not synchronize with individualism and reductionism. The first world consists of world of 'things' or physical objects; the second world consists of subjective experiences; and the third world consists of statements in themselves. The questions Popper attempts to answer are: Do the three worlds really exist? Can the World 3 be reduced to World 2? And can the World 2 be in turn be reduced to World 1? Popper distinguishes the three worlds on the basis that we can distinguish between (a) a real picture, (b) the process of imagining which is an effort on our part and (c) the more or less successful result of (b), i.e. the imagined picture. The world 3 of Popper does not consist merely of statements in themselves, but also of theories, problems and even critical arguments.

That the Popperian distinction between the three worlds is possible, is uncontroversial. However, the question remains

regarding the ontological status of the World 3 'objects'. Are they real as tables and chairs?

Popper argues that we do not claim that only 'physical objects are 'real'. We also include magnetic field, electric currents, pictures we see on television which are the result of 'abstract messages' that are transmitted in the form of waves and which are 'decoded', as real. The common characteristic of all the above 'reals' is that they can act upon physical things. Similarly, Popper points out that theories (like those of Maxwell and Hertz) have greatly changed the world of physical objects. Hence, theories (and in like manner problems, and critical arguments) are ontologically 'real'.

Popper rejects two objections, namely, that theories cannot act upon physical objects unless (a) they are in the physical object such as a book, which carries the message and (b) they are understood by the human minds. Hence, World 1 and World 2 are necessary for the existence of World 3. Popper points out that although there is interaction between World 1 and World 2, and similarly between World 2 and World 3, there cannot be any direct interaction between World 1 and World 3, without the mediation of World 2. Popper accepts that a theory should be 'incorporated' in a book (World 1) and to read and understand the book, human mind is necessary (World 2). But, the whole process needs a theory as such. This can be observed especially in relation to error in understanding a theory. As Popper argues: "I may make a mistake; my mind may fail to grasp the theory correctly. But there is always the theory in itself, and somebody may grasp it and correct me. It may easily be not a case of a difference of opinion; but a case of a real, unmistakable mistake - a failure to understand a theory itself. And this may even happen to the originator of the theory."

Popper then proceeds to show the various characteristics of World 3; i.e. autonomy, timelessness, etc. He claims that the World 3 is the product of human activity, result of evolution of human language and it has a history. The distinction

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between the three worlds, or the three world theory has been employed by Popper to solve the mind-body problem. And in his characteristic manner, he claims to have solved it.

Popper begins by assuming human mind as "an organ that produces objects of the human third world and interacts with them. Thus human mind (is) essentially (a) producer of human language, for which are basic aptitudes are inborn." He further assumes that language comes first, and is the only exosomatic tool whose use we acquire genetically. Popper proceeds to argue that it is "the emergence of descriptive language which is at the root of the human power of imagination, of human inventiveness, and therefore of the emergence of the third world." The function of descriptive language is not restricted for true descriptions alone, but also for lies, 'storytelling' and imaginative fiction.

Next, Popper makes a distinction between states of "consciousness" (highly organized states characteristic of human mind) and the human self. He says animals are conscious but do not have selves. Consciousness emerges before descriptive language, and hence "full consciousness of self" emerges through language, "only after our knowledge of other persons has developed, and only after we have become conscious of our bodies' extension in space, and, especially, in time; only after we have become clear, in the abstract, about the regular interruptions of our consciousness in sleep, and developed a theory of continuity of our bodies - and thus of ourselves - during sleep."

Popper distinguishes two problems in body-mind issue: (1) relationship between physiological states and certain states of consciousness; and (2) the emergence of self and its relation to its body. Popper attempts to solve 2 by means of (a) his theory of language, (b) objects of the World 3, and (c) the self's dependence on them. According to his consciousness of self involves various things such as distinction between bodies.

2. Ibid.
3. Ibid., pp.151-152.
living and non-living; distinction between bodies endowed with consciousness and not endowed with consciousness, projection of self into future, consciousness of existence in past and even theory of birth and death. This is possible "only through a highly developed descriptive language - a language which has not only led to the production of a third world, but has been modified through feedback from the third world." ¹

Full consciousness is a dispositional form, which though always present is not always activated. For example, when involved in intellectual work or artistic creating or problem solving we may not be aware of ourselves, not aware of the place we are in. Our minds are engaged in third world objects, claims Popper. Popper concludes the discussion saying that "such achievements of mind require an organ such as this, with its peculiar powers of concentration of a problem, with its linguistic powers, its powers of anticipation, inventiveness, and imagination; and with its powers of tentative acceptance and rejection. There does not seem to be a physical organ which can do all this; it seems that something different, like consciousness, is needed, and had to be used as part of the building material for the mind." ²

There is interaction between the various bodily organs, and between these organs and the mind. But, for the interaction with the World 3, we need mind in its relevant stages. Reading, writing, and even coding and decoding can be in terms of physiological system, but not the interaction with the World 5. Hence, Popper proposes a form of dualism, though not of Platonic or Cartesian type.

Popper has developed his theory in a more precise manner in his book *The Self and Its Brain: An Argument for Interactionism*, ³ co-authored with J.C. Eccles. Popper defends the existence of 'open system', i.e., a system which there are at least certain living organisms that 'interact' with some extra-physical influence, which could be called mind. Popper-Eccles' main thesis against the materialistic 'closed system' consists

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of (a) a belief in the existence of mind as a source of activity and (b) Darwin's 'trial-and-error' is universal even in socio-cultural development. Regarding (a) Popper says: "I want to conjecture that selves are the only active agents in the universe; the only agents to whom the term activity can properly apply." Popper is therefore, against the notion of self as a passive recipient of incoming sense-impressions (the traditional empiricist view or the associationist theory of mind), Popper rejects associationist psychology because it attempts to explain 'mind' on the basis of Newtonian physics, which is the result of Cartesian dualism. Again Popper rejects the materialist views of Feigl and other identity theorists. Regarding (b) Popper believes that Darwin's principle of trial-and-error is universal not only in nature but also in man's socio-cultural development. Evolution for Popper is a 'record of nature's experiments with successive processes'. He rejected the belief that it is a 'blind mechanic process'. Popper holds this view on the basis of certain recent interpretations of Darwin's theory of evolution, namely, natural selection does not operate merely on the basis of 'random variation' within a certain species, but also on the basis of other factors such as habits and preferences acquired by individual members of the species in selecting their environment.

But the basis of Popperian argument lies in his 'three-tiered ontology'. Popper's 'three-tiered ontology' as already seen above, consists of three worlds. World 1 is the physical world accepted by all including the materialists. The World 2 is the world at a certain stage of evolution and emerges from World 1. It is the world of primitive consciousness and its attendant mental events and entities. World 3 is the next stage corresponding to the intention of language. It is at this stage which is the seat of all ideas, theories, problems, critical arguments et al, which is briefly called 'objective knowledge'. Although World 3 emerges from the interplay between World 1 and World 2, Popper still claims that it is autonomous, i.e. it cannot be reduced to either World 1 or World 2 which is the materialistic

contention. Popper's main argument is that self which is distinct from mere mind or consciousness is in the World 3. It may be that in the process of evolution, both the development of brain and the development of language are simultaneous and supplementary. If such a conjecture is valid, then we could conclude that interaction between World 2, i.e., mind and the World 3, i.e., language brings about a modification in the World 4, i.e., the physical entity, brain.

Although the second part of the book, *The Self and Its Brian*, is mainly the product of Eccles, Popper takes equal credit for the same as it turns out to be in consonance with his theory of selves. The fundamental tenet is the strong belief that purely physiological analysis of the brain functions cannot explain the unity of our experiences or the unity of personality of the acting subject (self) to whom we attribute all the varied experiences. As Eccles argues:

Until now it has been impossible to develop any neurophysiological theory that explains how diversity of brain events comes to be synthesised so that there is a unified conscious experience of a global or gestalt character. The brain events remain disparate, being essentially the individual actions of countless neurones that are built into complex circuits and so participate in the spatio-temporal patterns of activity. This is the case even of the most specialized neurones so far detected, the feature detecting neurones of the inferotemporal lobe of primates. Our present hypothesis regards the neural machinery as a multiplex of radiating and receiving structures: the experienced unity comes, not from a neurophysiological synthesis, but from the proposed integrating character of the self-conscious mind. We conjecture that in the first place the self-conscious mind is developed in order to give this unity of the self in all its conscious experience and actions.

Eccles and Popper base their argument for the existence of self-conscious mind on two studies: one by B. Libet\(^2\) and the

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2. Psychologist B. Libet's experiment showed that when a train of signals from a weak repetitive stimulus to the skin reaches the somesthetic cortex and eventually gives rise to a conscious experience of being touched, it is apprehended as if it had been experienced a few moments earlier, it is 'antidedated'. This suggests a temporal analogue to the way in which, in normal vision, the signals from the eye arrive at the visual cortex are spatially projected by the mind and perceived as an object in the external world. (Of. John Beloff, "Is Mind Autonomous" in BJES, Vol.29, Sept. 78, p.263).
other by H. Kornhuber. He said that a purely physical explanation of the findings of Libet and Kornhuber is impossible. They claim that Kornhuber phenomenon is a pure example of a mind acting on the brain.

Both Popper and Eccles will have to answer a number of queries regarding their position. The general trend of criticism could best be expressed in Beloff's words: "The authors will be openly accused of cheating, of inventing bogus entities to which then be ascribed whatever powers are needed to produce, however miraculously, the phenomenon we have got to explain. Their self-conscious mind, it will be said, which is continually extracting information from the brain or controlling its output is but the latest version of that homunculus from which scientific psychology has, from its inception, striven to free itself. Our task, instead, should be to propound models of mind, of mental functions, which can be tested by using them to programme a computer that would then simulate the relevant behaviour." 2

To ascribe autonomy to Popper-Ecclesian conception of mind, we must credit mind with some basic mental functions, such as willing, understanding, etc., which are logically prior to its (mind's) engaging with the cerebral machinery and, hence, could be claimed to be that of psychical rather than psychological nature. If, for the sake of argument, we accept that there is such an 'instantaneous global or gestalt recognition' as a power possessed by the mind and which is irreducible to or unexplainable in terms of psycho-physical properties then we would be going against the whole post-Galilean science which accepts the reductionist and analytical aims. It is on the basis of such a mechanist-reductionist approach that biology and other natural sciences have made tremendous progress and are progressing. Would scientists accept the dualistic metaphysics of Popper-Eccles in place of their ultimate reductionist goal?

1. H. Kornhuber studied the build up of a 'readiness potential' in the motor cortex that precedes voluntary movement. The subject's task, in this instance, was simply to wag his finger periodically while being otherwise in a totally relaxed state, a condition not easy to achieve without plenty of training. (Cf. John Beloff, (1978), p.269.)

Strangely enough, the evolution of World 3 could also be explained in terms of panpsychism, parallelism or epiphenomenalism or any other theory of mind-body relationship. It does not necessarily need Popperian 'interactionism'. The only idifference would be that role of mind would be restricted to merely explain the events occurring. Popper's positive contribution in the theory is his explanation of the origin of the consciousness, which seems to arise suddenly out of nothing, or out of the totally incommensurable world of matter, and did so at a juncture where it is needed if evolution was to continue.  

As Beloff points out: "To call it one of nature's inventions and to compare it with the emergence of flight in the archaepteryn or even with the emergence of life itself, does not allay one's intellectual discomfort if only because it is so hard to see how consciousness could have arisen by trial and error."  

Another issue that deserves attention is the term 'interactionism'. Popper observes two different types of interactions between 'worlds', i.e., between World 1 and World 2, and between World 2 and World 3. As Popper puts it: "It (World 3) really does exist; and not only does it exist but it is active; it acts upon us (only, of course, by way of interaction). I conceive the relationship between World 1 and World 2 as being similar." Yet, if we take the term 'interaction' literally, we may define it as a two-way causal process between two distinct entities. But Popper further claimed that the entities of World 3 are timeless abstractions. How can they, then, actively participate in temporal processes? Of course, Popper's interaction between World 2 and World 3 is something different. It could be some sort of 'cognitive act' in which a 'mind' grasps (understands) some abstract object of thought. It could, therefore, be a mental event, taking place in World 2, which again is dependent on World 1, i.e., brain. The whole issue remains unsolved because, Popper's understanding of the term 'interaction' is confusing. One does not know whether by interaction he means interaction  

between cultures etc. or interaction in literary sense which presupposes reciprocal. One really does not know.

The three world classification and the autonomy of the World 3 creates another difficulty. The World 3 can be autonomous in as much as universals are irreducible to particulars. But, the three world classification offered by Popper-Eccles is a contribution to ontology and not to epistemology.

The 'strong dualism' of Popper-Eccles does not seem to be strong enough to reject the materialistic thesis that is backed by enormous evidence which is increasing day by day. But Eccles tries to reconcile the materialistic evidence with his own belief in the 'self-conscious' mind. For example: "Following a commissurotomy (a surgical transection of the corpus callosum) one part of the individual, that part that has the power of speech, which is independent on the left hemisphere, evinces no awareness of signals reaching the right hemisphere although, that these are duly recognised, can be shown if the individual uses a non-verbal response governed by the right hemisphere, e.g. pointing with his left hand." 1 It looks like that following 'operation' the self-conscious mind of Eccles changes its abode. Eccles' explanation is unconvincing compared to the materialistic interpretation! Materialism, therefore, seems to be unquestionable.

But some recent researches may sometimes be taken to be evidence contrary to our position. They attempt to project some mind activity which seems to be independent of the brain mechanisms. However, even this evidence that Eccles produces, would not make any difference to the materialist exponent, who would argue that the alleged 'evidence' is the result of 'inadequacy of scientific knowledge of the workings of the brain.' Thus, we can argue that the whole Popperian attempt seems to be futile.

2. For instance, Dr. R.A.Moody's Life after Life, and J. Eisenbud's "Paranormal Photography" in E.S. Woman's Handbook of Parapsychology, are attempts to point out to some mind activity which is independent of human physiology.