

# THE CONCEPT OF CAUSALITY : SOME CLARIFICATIONS

A THESIS SUBMITTED FOR THE DEGREE  
OF PH.D. IN PHILOSOPHY  
AT THE  
UNIVERSITY OF NORTH BENGAL  
2002

*Submitted by*

*Ananda Pramanik*

UNIVERSITY OF NORTH BENGAL  
Library  
RAJA RAMMOHUNPUR

*Under the joint supervision of*

*Prof. Pabitra Kumar Roy  
&  
Prof. Manjulika Ghosh*

DEPARTMENT OF PHILOSOPHY  
UNIVERSITY OF NORTH BENGAL  
RAJA RAMMOHUNPUR, DARJEELING

Ref  
1.30  
P. 8'962

151892

2 5 MAY 2003

STOCHING-2004

W02-DNA/115018

## **PREFACE**

This tract on the concept of causality is finally completed and it is now ready to be submitted for evaluation. I should like to avail myself of this opportunity for expressing my gratitude and thankfulness to all the persons who have helped me in the process of drafting the thesis.

To say the best I am immensely grateful to my supervisors, Prof. Pabitra Kumar Roy and Prof. Manjulika Ghosh for their kindness in helping me clarify my ideas and improving my style and expression. It is but for them that I could complete my project.

To my wife Mrs. Arati Pramanik I stand in personal indebtedness for her emotional support and unfailingly comforting in the hours of gloom and despair. She never failed me in spite of her own physical distress and ailment.

To the teachers of the Department of Philosophy I remain beholden for their encouragement and inspiration. To Professor Raghunath Ghosh I am thankful for his kind and timely advice.

I thank the members of the staff of the University Library for their cooperation, and Sri Ashis Nag for bearing with me in composing and printing out the thesis in a presentable manner.

**Ananda Pramanik**

## CONTENTS

	<b>Pages</b>
<b>Preface</b> .....	
<b>Chapter – I : Introduction</b> .....	<b>1</b>
<b>Chapter – II : The Concept of Causality And Rationalism.</b> .....	<b>15</b>
2.1 The Early Rationalist Approach .....	<b>15</b>
2.2 The Later Rationalist Approach .....	<b>35</b>
<b>Chapter – III : The Concept of Causality And Empiricism.</b> .....	<b>59</b>
3.1 The Early Empiricist Approach .....	<b>59</b>
3.2 The Later Empiricist Approach .....	<b>73</b>
<b>Chapter – IV : A Synthesis of Rationalism And Empiricism.</b> .....	<b>92</b>
4.1 Kant's Transcendental Approach .....	<b>92</b>
<b>Chapter – V : The Concept of Causality And Modern Science.</b> .....	<b>111</b>
5.1 Modern Science And Indeterminism ....	<b>111</b>
5.2 Modern Science And Determinism .....	<b>123</b>
<b>Chapter – VI : Conclusion</b> .....	<b>148</b>
6.1 The Source of the Drawbacks in the so-called Theories of Causality : The Confusion of The Epistemological Notion of Causality And the Ontological Notion of Causality. ....	<b>148</b>
6.2 The Proposed Solution to the Problem of Causality : The Concept of Causality is still a Working Hypothesis. ....	<b>154</b>
<b>Bibliography</b> : .....	<b>159</b>

# **CHAPTER – I**

## **INTRODUCTION**

In presenting the thesis, it has been my intention to offer some sort of clarifications to the concept of causality in philosophy and science and thereby I have tried to remove some ambiguities involved in the concept as well as in its use. My standpoint here is never historical, that is, I have not included within the purview of my discussion each and every aspect of thought relating to the development of the concept of causality, rather I have been selective all along in my attitude towards the issue by focusing on some major problems of it. It is an undeniable fact that all most all the branches of knowledge, whether philosophical or scientific, have been using as well utilizing the concept of causality very widely. In spite of the enormous work already done in the field, it appears to me that the philosophers as well as the scientists have rendered the concept of causality to an ambiguous one and, therefore, no accuracy in the meaning of causality has been reached so far. Consequently, this sort of impreciseness, rather the ambiguity, has been responsible for the generation of the long term dispute among the philosophers and the scientists.

Not only philosophy but also science are, somehow or other, engaged in search of causal explanations of things. Science, as we know, is a knowledge which claims to be exact, certain and fully organized. It is better to call it as well organized real knowledge, "Mr. J. Arthur whose little book entitled *An Introduction to science* is recommended to the reader, following Pearson and many other modern scholars, defines science in this way. "Science is the complete and consistent description of the facts of experience in the simplest

possible terms.”<sup>1</sup> What this specification implies is that a scientist in his study of a group of natural phenomena first collects the facts, analyses and classifies them, and then he studies the conditions under which they occur, that is, he tries to find out their causes and formulates their causal laws on its basis. In other words, the scientist is giving here a kind of explanation of a thing to show the conditions under which it occurs, that is, its causes, for example, the explanation of typhoid by the invariable presence of a certain kind of bacillus. On the other hand, the philosopher like a scientist is also in search of knowledge which is equally certain, exact and well organized. But what is worthnoticing is that philosophy does not remain content merely to determine the invariable sequences of phenomena and formulates their manner of behaviour. Rather it tries to provide some ultimate explanation of things – their first cause, their moving cause, their teleological cause, and so on. This shows that philosophy is also interested in giving an explanation of the world in terms of causality. Obviously, not only science but also philosophy has the same purpose of discovering the causal relation and formulating laws governing the phenomenon. In this connection, it is to be noted that common people also have the conviction that whatever happens is due to some causes whether they are known or unknown and deal with the world around them on the basis of such conviction. However, man is both an agent and a patient such that he not only tries to adapt himself to his environment but also tries to adapt environment to his needs and purpose. But the essential requirement for doing this is the knowledge of the cause and effect, i.e., the knowledge without which he is not properly able to deal with the things around him. Therefore, the search of causal connection in this sense is theoretically and practically important, but it is admitted that the discovery of this causal relation has posed a great problem to the philosophers as well to the scientists.

---

<sup>1</sup> Patrick : *Introduction to Philosophy*, p. 20

In the light of the foregoing discussion, it is obvious that the most important question giving troubles to us is concerned with the search of what this causal relation is, that is, with the inquiry into what the nature of this causal relation is. In this connection, philosophers have used the concept of causality in different senses, viz. anthropomorphic sense, logical sense, metaphysical sense and empirical sense. The anthropomorphic sense of causation is defined as an animistic type of explanation of the causal relation. It has tried to interpret the nature of the causal relation on the basis of the analogy that when we do things or suffer things done to us, there is a feeling or experience of power or force which acts as an agent. Therefore, when we see things happening in nature, we carry over our inner experience of the effort or power or agency which causes things to happen, and assume that causation is just such a case of power or enforcement. This also resembles the idea of the common man who is not trained regarding causality because he equally believes causality as a relation in which the cause produces an effect. The consequence of this position seems to be that the causal relation is a process where the cause as an agent enforces the effect to be produced. This is a view which holds that the cause as a substance necessarily produces the effect so that this cause is conceived of something as inevitably giving rise to the effect through transference of its power. If so, when we speak of mechanical causes, it is very hard to believe that even in such cases there is no such enforcement and necessary connection between a material cause and its effect. On the version of the anthropomorphic sense of causality we must admit that there is certainly a necessary causal relation in this case. The concept of cause as 'power' is not only admitted by the common sense people but also supported by the philosophers like Locke. Locke is of the opinion that the causal relation is the expression of "power" which does possess two aspects, viz, the capacity to produce a change and the capacity to receive a change. According to him, the idea of power is necessary for the apprehension of the changes and seems to

allow the necessary connection in causality. He says that in our every day life we have a justification for this notion when we experience fire that melts the gold, and the gold that is melted by the fire. He thinks that in our day to day experience of volition we are directly aware of the operation of power or cause with reference to its effect. This anthropomorphic sense of causation is very obvious when Locke says, "The idea of the beginning of motion we have only from reflection on what passes in ourselves, where we find by experience, that, barely by willing it, barely by a thought of the mind, we can move the parts of our bodies which were before at rest."<sup>2</sup> But this experience of volition or the psycho-physical interaction is one which we know by means of experience. This experience fares no better than the ordinary experience which cannot help us to know clearly the mode of our mind's operation on the physical substance. That is why, Hume argues that we cannot get this causal relation in the physical world.

The concept of causality in the logical sense has been propounded especially by the rationalist philosophers. These philosophers have identified causal relation with the logical implication or the relation of entailment which has been interpreted in terms of logical necessity. The concept of deductive method, which Descartes calls 'mathematical' and Spinoza calls 'geometrical' leads to this identification as mentioned above. In a deductive inference, the premise which is said to be the logical ground implies its conclusion logically and, therefore, the relation between as the premise and its conclusion is logically necessary. It is like the necessary way in which the properties of a triangle are entailed by the definition of the triangle. The relation between cause and effect has been explained analogously to the relation of logical entailment between the premise and its consequence in an inference. Therefore, the effect is derived necessarily from the very nature of the cause in the same way in which the conclusion is logically derived from its premise. If so, such an

---

<sup>2</sup> Locke : *An Essay Concerning Human Understanding*, p. 138.



interpretation has reduced the concept of causality to an analytic concept and, hence, to an a priori principle. On this version, the concept of causality implies two things. First, when we say 'A causes B', we mean that whenever A occurs, it is followed by B. Secondly, it is not only the case that B follows A but it must follow A. This shows that the causal relation is a necessary relation. Now it is usually pointed out that the cause is regarded as the antecedent event which comes before the effect, and the effect is the consequent which comes after the cause. Hence, we generally refer to this temporal relation of before and after between the cause and the effect. But the logical view of causality does not imply this time – gap between the events because both of them, strictly speaking, are only simultaneous in time. However, the rationalist philosophers have reduced this notion of causality to the metaphysical concept in so far as they have consciously identified the cause, i.e., the logical premise (the ground) with the Divine Mind or Causa Sui and made it a source of all causal necessities. The rationalist philosophers, therefore, argue that the whole universe is full of order where the effect follows with strict logical necessity and universality from its Causa sui or the Divine Being and, consequently, such a view leads ultimately to the causal determinism. Again, since the rationalist's identification of the cause with the logical premise (i.e., the logical ground) has made the cause and effect simultaneous, it goes against the time-gap (i.e., the relation of before and after) which is an indispensable part of our concept of causality. It seems obvious that this time-gap can be maintained on condition our mind can proceed in finding out that events on the basis of particular experiences and not from any logical premise. Jevons says, "Endow mind with the power to travel about, and compare part with part, and it could certainly draw inferences concerning the similarities of forms, the co-existence of qualities, or the preponderance of a particular kind of matter in a changeless world. A solid universe, in at least approximate equilibrium, is not inconceivable, and then the relation of cause and effect would evidently be no more than the

relation of before and after. As nature exists, however, it is a progressive existence ever moving and changing as time, the great independent variable, proceeds."<sup>3</sup> Hence the rationalist's interpretation of causality is not satisfactory. The rationalist's interpretation of causality is not satisfactory and the modern view of causation is that which brings about a change in a thing and which can be known empirically. It should be mentioned here that modern epistemology and science are in favour of finding out the causal relation on the basis of facts, and therefore, they are trying to solve the problem not by any appeal to any such mystic approach as the rationalists have adopted.

Sometimes the concept of causality has been used in the metaphysical sense such that it admits one ultimate cause which is no other than the Divine Mind or Absolute. According to this view, the things and beings in the world follow with metaphysical necessity from this Divine nature. It is, in fact, the rationalist's consequence of the identification of the logical ground with the Divine Being whose nature necessarily entails the finite things as its effects. Now this metaphysical causality has been understood usually in two senses, viz, the First Cause or the Causa Sui and the Final Cause or the teleological cause. In so far as the concept of the First Cause is concerned, it has been interpreted as the uncaused cause which is the cause of everything but which is caused by nothing outside it. Now, science remains satisfied with the belief that every event has a cause and finds this assumption fully justified on the basis of the First Cause. Philosophy adopts a different attitude to this problem and goes back over an infinite series from effect to cause. To stop this infinite regress in the causal process, philosophy accepts the First Cause at the back of this causal chain. Here we say (approximately naively) that in the beginning god has created this world and introduced everything which seems even perplexing to us. On the other hand, there is another sense of the metaphysical causality

---

<sup>3</sup> Jevons : *The Principles of Science*, pp. 220-221

which is used to mean the Final cause. The expression "final cause" is used by Aristotle in a special sense in which it does not mean any first or last cause, but only to the end or teleos. In the case of human affairs the end or purpose of an action or production is spoken of as a cause, for example, the observation of an anticipated eclipse of the sun is the cause of setting up a telescope in a certain place. So, the question arises whether in nature there is an end which may be regarded as determining all the natural processes. If by the word 'teleos' we mean the end or goal, then this interpretation also resembles that of the idealist thinkers who also maintain that there is an end or purpose in this world. According to this standpoint, causality in this sense is an eminent purposiveness in the heart of all things and explains all the changes in the universe. It holds that there is an ultimate spiritual reality which realizes its own self in and through the things of the universe. The uniformity or the unity of nature already reveals the fact that the world or the universe is directed towards this end which is the embodiment of all values. The idealists have identified this end with the Absolute or the Divine Mind. If so, this teleological causality is known as finality and, therefore, causality in this sense is always finality. This shows that the concept of causality in nature cannot be explained without this final causality which is identical with the Absolute or the Divine Mind. In this sense, it may be accepted that the nature of everything has an innate tendency or capacity for developing in a certain direction. We may call it the power of response to the right stimulus. But it is not the proper explanation of the changes because without an external cause or stimulus no internal potency can manifest. Commenting on Aristotle's view of cause. Guthrie says, "Something else must act in the threefold capacity of efficient cause (as initiating the motion), formal cause (for in natural generation the start must come from a number of the same species) and final cause (a representing the goal to which the development will

be directed).<sup>4</sup> However, we can say that the concept of causality in the sense of teleological cause is only a metaphysical notion and does not have any common usage. Besides, modern scientific researches are no more concerned with the teleological cause in Aristotle's sense.

The empirical concept of causality has been propounded strictly by the empiricist philosophers. This concept, as the very name indicates, is said to be derived from our experience of the events. The exponents of the empirical concept of causality hold that the so-called necessary relation, whether logical or metaphysical, is obviously groundless in so far as it is not available through sense-experience. The most distinguishing philosopher in this connection is Hume who claims that knowledge of causes must come from experience. But we know nothing of what kind of thing it is that causes another to happen or whether every event must have a cause, except in so far as we can justify our claims by reference to actual experience of constant regularities. We only perceive that one event is followed or preceded by another, for example, firing of the gun followed by the death of a man or the later is preceded by the former. We do not perceive any "power" by virtue of which the first necessarily produces the second and, hence, we do not experience any such necessary relation between the two events. In this sense the empiricists do not admit that cause is any kind of "power" nor do they admit any necessary relation between cause and effect. The inevitable outcome of this empiricistic standpoint is that it goes against both the anthropomorphic notion of causality and the rationalist concept of causality. However, the positive view in this connection is that the concept of causality is merely the regularity or uniformity in the succession of events. On the Humean version, when we experience that one event is uniformly followed by another, the ideas of them become associated in our mind so that whenever we think of the former, we cannot but expect the latter. This

---

<sup>4</sup> Guthrie : *The Greek Philosophers*, p. 135.

shows that causality is nothing more than "uniformity of succession" of events, and cause in this sense is to be regarded as only the "invariable antecedent" of the effect. Secondly, our experience of the constant regularities in the succession of events begets in us the habit of expectation that since one event A has happened the other event B will follow and thus we jump to the idea of necessary connection between A and B. If so, this necessary relation is that which does not really exist in the external world but exists as a habit in our mind. This perspective is otherwise called the regularity view of causation. It is, as Russell holds, almost like an inductive truth; if it fails to work, we are required to collect more instances to establish the causal connection more strongly. But this empiricistic view of causality is not satisfactory because the arrangement of cause and effect is not a matter of imaginative construction or habitual expectation in our mind. On the contrary, the happening of one event is well connected with its previous stage, and, hence, it is based on fact and the root of this necessary connection is the fact itself. Bosanquet says, "Reality being a system of reciprocally determining parts, every part of feature of reality may be regarded as a consequence to which other part or parts, or ultimately the whole, stands as ground. Every consequent, so this law tells, has a ground from which it necessarily follows. Necessity indeed means nothing but the inevitableness of the consequent when the ground is given."<sup>5</sup> Here we cannot but admit that Nature is a coherent system such that it does not allow any accidental or whimsical happening in it, and so there is a sufficient ground for the happening of one event after another.

The foregoing considerations are evident enough to show that the concept of causality has been the main issue of dispute between the two traditions of rationalism and empiricism; the former accepts the necessary connection, while the latter denies it, thus leading to the imprecision in the

---

<sup>5</sup> Bosanquet : *Logic or Morphology of Knowledge*, pp. 212-213.

concept of causality. In this connection, Kant has tried to synthesise these two contentions by introducing the concept of transcendentalism in philosophy. As opposed to Hume, Kant argues that the relation of causality is never contingent but a strict necessary connection between cause and effect. According to Kant, the origin of the idea of cause does not lie in the repetition of facts (i.e., in succession). On the contrary, its origin is apriori representation by virtue of which the causal relation happens to be universal and necessary. He holds that the validity of universality and necessity of causality can be judged with reference to experience because any experience of objective succession is of the necessary connection. However, Kantian standpoint of causality goes against our common sense and scientific views of the concept. This is so because in common sense and science there is no room for any such apriori idea for the origin of causality. Both of them have laid an emphasis on the factual and dynamic character of causality, and this is what is lost in the Kantian interpretation of the concept. According to Kant, the logical ground to connect cause and effect cannot be found in the empirically given time series but only in a non-temporal world. In this way, Kant goes beyond the common sense use of the word "cause". The contemporary scientists also do not favour this idea of causality as they are interested in analyzing the concept on the basis of scientific research and logical articulation of the facts. What is more important to note here is that Kant's interpretation of the causal synthesis in terms of transcendentalism bears the stigma of being a psychological concept. Paton says, "The other way is simply to assert that Kant's doctrine of transcendental synthesis is a mistaken kind of psychological doctrine which need not be taken seriously."<sup>6</sup> However, this dispute continues in the modern sciences as well. An advanced scientific understanding of the world is not in need of such transcendental notion of causality in the Kantian sense of the term. Most of the scientists like Jeans,

---

<sup>6</sup> Paton : *Kant's Metaphysics of Experiences*, p. 280.

Hiesenberg, Eddington and others argue in the line of Human tradition that causation is a mere sequence of events. The causal law is like a statistical law because it is constructed on the basis of the observation of the average behaviour of atoms. The observation in question shows that there seems to be no strict causality in the atomic behaviour, and, hence, these laws are indeterminable. These scientists are more in favour of eliminating the concept of strict causality from the domain of science. What goes here under the name of causality is based on the observation of the regularity or uniformity in the sequence of the behaviour of the atom. On the other hand, Planck, Einstein and other argue in favour of the strict causality in the domain of science. According to them, it may happen that experimental difficulties do not always help us to find out the strict causal relation in the subatomic processes. But this does not mean any causal indeterminism in the field. Whitehead has made an attempt at synthesizing these two opposite views of determinism and indeterminism by saying that we can directly perceive the causal relation when we observe two events in succession, and our consciousness understands this common ground (causality) when it observes the similarity of relation on various occasions. If we stick to this position, then it involves the fundamental claim that we depend here on both observation and understanding. But Venn argues that our understanding itself has a limit, while the empiricists hold that observation (sense-experience) gives us only the regularity in sequence. In this connection, I shall say that the nature of causal connection is such that not any type of interpretation is able to discover its nature, and so it is theoretically difficult to establish this causal relation. Secondly this relation is such that it cannot be demonstrated mathematically or deductively to make the people wholly convinced of it. But there are so many facts which cannot be proved in the sense required and, therefore, they remain almost outside the scope of our proof – techniques. For this reason alone, we cannot come to the conclusion that they do not exist or they are not valid. Similarly, though it is not possible to observe the

connection and physical connection belong to two distinct categories. In chapter III, I have put the empiricist approach to the concept of causality. Here I have argued that the philosophers of this tradition have faced a lot of problems in handling the concept of causality adequately. I have said that none of them has been able to supersede the Humean conclusion that causation is only a de facto regularity in the succession of events. Hence, this standpoint cannot explain the objective connection in the concept of causality. In chapter IV, I have presented Kant's transcendental idealism which has tried to synthesise the rationalist and the empiricist views of causality. Kant says that we begin with the observation of empirical facts and then our understanding synthesises them by introducing the universal and necessary relation of cause and effect. On this version, the events are chained by the necessary succession in time-determination. But my contention is that it has been a psychological doctrine and so it fails to explain how this causal relation is imposed on the succession of events in the external world. Kant's merit is that he has laid an emphasis on the necessary relation of causality without which we cannot experience the world which changes in one homogeneous and continuous time. It is also the underlying assumption in common sense and science, i.e., the assumption without which science cannot make any progress. In chapter V, I have addressed the problem of causality from the standpoint of modern science. In this connection, I have raised the issue of determinism and indeterminism. My conclusion is that though all the persons who are very tough-minded realists will insist on determinism or absoluteism of the law of causality, yet we may argue that we do not have the logical ground to assert this causal determinism from the standpoint of positivism. Rather, we should admit that what we experience is the regular sequence of events in time. If so, this principle of indeterminism has led itself to go for the Humean concept of causality. In chapter VI, I have come to the conclusion that the major source of the ambiguity is due to confusing the two concepts of causality, viz., epistemological concept of causality and ontological concept of causality. My



argument is that the ontological causality, i.e., the causality as it is in itself goes beyond our human discovery, and therefore it should be kept separated from the causality for us, i.e., the causality as we know it. The conclusion is that causality in this later sense is still a working hypothesis.

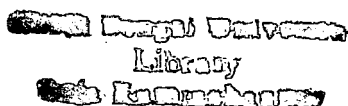
## CHAPTER - II

### THE CONCEPT OF CAUSALITY AND RATIONALISM

#### 2.1 The Early Rationalist Approach

There is no doubt that the concept of causality has been the main locus of dispute between the two traditions of Rationalism and Empericism. What is worthnoticing here is that the rationalist variety of thinking has laid a great emphasis generally on the view that the concept of causality entails a necessary connection between the two events of cause and effect. In this connection, the rationalist philosophers have brought in the concept of the "Divine Will" or "Causa Sui" in their interpretations of the concept of causality, and they have made this idea a source of all causal necessities. Now the word "Causa Sui" is a Latin word which means 'cause of itself or himself' and, hence, the expression in this sense applies only to God. Since God cannot be produced by or be dependent upon anything else, the philosophers of the rationalist tradition insist that God is the cause of everything. On this version, the entire world is thought of well ordered by the divine or metaphysical necessity. The immediate implication of this position is that nothing in this world as conceived by the rationalists is contingent but a part of necessary relation as a whole. The philosophers who are in favor of this view are called speculative philosophers or speculative metaphysicians. This is because their sole interest lies in giving only a rational explanation of this universe by reducing the multiplicity to the unity ; the explanation of things and beings in terms of causality in this sense signifies the explanation of the existence and nature of finite objects only in terms of one ultimate causal factor. Socrates and Plato have occupied the most significant place among the early rationalist thinkers because they are responsible primarily for the beginning of the rationalist movement in the history of western philosophy. It is needless to say that the concept of causality has received a very important shape in their hands such that their views on it have influenced positively the subsequent thinkers belonging to the rationalist tradition.

The philosophy of Socrates marks the beginning of the rationalist trend of



151892

29 MAY 2003

thought in the western philosophical tradition. However, Socratic statement about causation has appeared to be obscure and inaccurate. The concept of causality which Plato has developed here should really be taken as the starting point of the rationalist movement in this connection. The Socratic teaching, as it is evident from the context of the earliest dialogues of Plato, is essentially ethical, i.e., he is found to be concerned with the ethical questions like "What is courage?", "What is beauty?", and so on. Such questions are formulated schematically thus: "What is X?", and the answer to such questions leads to the Socrates' theory of Forms as causes. According to Socrates, the questions of the "What is X?" type can be answered by referring to the concept of X or the definition of X. In this sense, 'This X is X because it "partakes" of the nature of Form or Concept 'Xness'. So empirical objects are beautiful because they partake of the nature of the Form "Beauty". Socrates seems to hold that Forms are present, though partially, in the empirical objects. They are changeless entities that underlie all the changes in the sensible objects. In this sense, the Forms are the real causes in the world. The concept of causality can be made clear by referring to the Socratic position in the *Phaedo*. He is concerned here with the teleological causation explained in terms of purpose or ends. It is the causation which is found when a man is said to pursue some end because it is good, and, hence, he is not concerned with the mechanical causation which is found in the case where one billiard ball hits another. This shows that Socrates thinks that the only satisfying form of causation found in the activity of the mind is the Form of good, i.e., the Form which is the culminating point of all our human activities. Hence, the immediate consequence is that the Form of good in this sense is a teleological cause which has been invested with "force" or "power" such that it brings about effectuation or causation. Thus, the sole pattern of the teleological explanation of cause found in the *Phaedo* is that which is exemplified in the purposeful agency of a mind. But this Socratic position in this connection fares no better because he is in puzzle in finding out this cause. Vlastos says, "Socrates makes it abundantly clear that he is still, at the time of speaking, "deprived" of the teleological *aitia* he had been looking for." The implication of this remark is that if Socrates had thought of the concept as the teleological cause, then he would not have said that he is still "deprived" of teleological *aitia*. Here we should not carry on this problem farther because of the lack

of evidences in his support. Zeller says, "Socrates himself left no writings behind him, so that those of his pupils, Plato and Xenphon, are the only trustworthy sources from which we can expect to derive any information about his philosophic views."<sup>2</sup> In addition to these sources, some writers like Huby refers to "The Clouds", a comedy by Aristophanes, as also an important evidence for information. However, it is an undeniable fact that Plato has tried to carry out Socrates' mission in his own way and developed the idea of his master in his dialogues. So we can at best conclude here that the dialogues themselves have been purely Platonic doctrines where the historical Socrates cannot be imagined. That is why, it is not always possible to distinguish sharply between the contributions of Socrates and those of Plato. Huby says, "It is probable that Plato's earliest dialogues give a fair impression of Socrates' methods and the subjects he choose to discuss, though it is not likely that the dialogues themselves are reports of actual conversations".<sup>3</sup> It seems, however, to be legitimate to hold that an account of Plato's view is also expected to exhibit fairly Socrates' ideas as well. Stace says, "All we can say is that they contain the gist and substance of the philosophy of Socrates."<sup>4</sup> Consequently, we shall be concerned here with Plato's view of the concept of causality.

According to Plato, Forms or Ideas are regarded as the "Cause" of sensible objects, and hence the relationship between the Forms and the sensible things is very important to understand the notion of causation in Platos' philosophical system. Since Plato's exposition of the concept of causality shows that the Form is the cause of sensible objects, his view of causation is, thus, based directly on his theory of Forms. However, it cannot be said that the theory of Forms is entirely due to Plato because it is already available in some form or other in the thoughts of his predecessors. It is clear in this regard that Plato has been influenced by Parmenides on the one hand and by Heraclitus on the other. He has been influenced by Parmenides by the concept of Forms which are uncreated, eternal and unchangeable entities supplied by the reason alone. On the other hand, Plato shows respect to Heraclitus' view of change that the sensible world that we know with the help of our five senses is changeable or becoming, i.e., the sensible objects are in a constant flux. According to Plato, if the sensible objects are always changeable, then the non-sensible objects alone are unchangeable. The non-

---

2. Zeller : *Outlines of the History of Greek Philosophy*, p. 99.

3. Huby in *A Critical History of Western Philosophy*, p. 15.

4. Stace : *Critical History of Greek Philosophy*, p. 141.

sensible objects are "essences" which he calls Forms. Mention may be made here to Socrates' view, and we may claim that a concept, i.e., an adequate definition of a word gives an exact account of the essential nature of an object to which it refers. So the Forms here stand for the 'essence' of the thing. Commenting on Socrates' view of the purpose of a definition, Huby says, "By "essence" seems to be meant something which is peculiarly central to the thing, stated so that we have in a nutshell enough information to feel that how at least we really know what it is. Once we have this information, not only can we recognise the presence of the thing defined, but we can also deduce from the definition a great deal more information about it."<sup>5</sup> In this connection, it is equally important to know that Plato has used the words 'ideas' or 'Forms' to mean these unchanging and eternal objects existing apart from this world of sensible particulars. Now a confusion may arise regarding Plato's use of the words 'Ideas' or 'Forms' because he has used the words 'eidos' and 'idea' more or less interchangeably. It should be noted here that the word "eidos" means either a distinct class of objects or the peculiar 'structure' which constitutes a set of objects into a distinct kind. If so, the sense of the word 'eidos'. Crombie has tried to remove this confusion and says, "I shall use the word 'Form' as a standard translation of *eidos* and *idea*, though other words such as 'nature', 'kind', 'property', and 'universal' will (following Plato's own looseness of terminology) be used as well."<sup>6</sup>

It should be mentioned here that though Plato's theory of Forms is well known to us, yet the clear picture of the theory is not available easily. Huby says, "This "theory" is not set out in full anywhere in the dialogues, and on many points the dialogues are uninformative or inconsistent. But the theory may be reconstructed in its essentials without much difficulty."<sup>7</sup> There is a line of thought which has, as summed up by Huby, led Plato to believe in the Forms, and this has been stated as follows: " 1. In geometry we become familiar with the notion of perfect triangles and circles, and we distinguish these from the diagram we draw on paper and the actual triangular or circular shapes of some tables, postage - stamps, or shawls. The diagrams and the tables are only approximately triangular, and if we measure them carefully enough we shall find out

---

5. Huby in *A Critical History of Western Philosophy*, p. 16.

6. Crombie ; *An Examination of Plato's Doctrines*, p.49

7. Huby in *A Critical History of Western Philosophy*, p. 18.

their flaws. The triangles that are the subjects of our theorems, however, are necessarily perfect. If there exist then they must be very different from the things we see and touch. And to Plato it would have seemed absurd to suggest, as later philosophers might, that things about which we can reason so clearly and surely did not exist."<sup>8</sup> "2. Particulars may be imperfect in other ways. Even the most beautiful woman or statue is not flawless, and we can conceive of something more beautiful still. We can, Plato believed, think of absolute beauty, but this too cannot exist in the world of sense."<sup>9</sup> "3. Finally, there is the puzzling fact that particulars are able to be the subject of contrary predicates. Peter, for instance, may be tall when compared with James, but short by the side of John. But all the time he is one man Peter. But if you can say two contrary things of the same man at the same time, it looks as if he is somehow imperfect and not fully real. That which was truly tall would surely never in any way be short."<sup>10</sup> On the basis of such arguments Plato comes to believe in the existence of Forms and claims that we can understand the meaning of the words 'perfect beauty', 'perfect equality', etc., although they are not found in the world of sensible objects. According to Plato, when we see such imperfect examples, they make us remind of their perfect originals, i.e., their eternal and perfect Forms. There is another essential characteristic of Plato's Form in so far as he has assigned to them an objective reality, and as such the Forms are considered to be the metaphysical substances. Stace says, "His theory of Ideas is the theory of the objectivity of the concepts. That the concept is not merely an idea in the mind, but something which has a reality of its own, outside and independent of the mind - this is the essence of the philosophy of Plato."<sup>11</sup> Socrates has regarded the concepts merely as a rule of thought or an idea in the mind, i.e., the regulative principle by virtue of which we compare any act, for example, with this concept, viz, the concepts of virtue (i.e. the definition of virtue) in order to ascertain whether it is virtuous or not. But Plato has transformed such regulative ideas into metaphysical realities. Now the question is : How does Plato arrive at this doctrine ? Plato like Socrates is in favour of the view that our knowledge is the knowledge of concepts and our knowledge is true only if our concept corresponds to or is a copy of something that exists outside i.e., an objective reality. According to him, if the concept does not correspond to its external objective reality it

---

8. Huby in *A Critical History of Western Philosophy*,

9. *Ibid*, p. 18.

10. *Ibid*, p. 18.

11. Stace : *A Critical History of Greek Philosophy*, p. 141.

will be a mere construction of imagination'. Therefore, there must be objective reality outside my mind for our knowledge of concepts or ideas to be true. Plato holds that there exists such a thing as the absolute *Beauty* or the one beauty itself, for example, and it is that reality of which the concept in my mind is a copy or to which my concept corresponds. Consequently, Plato is going farther than Socrates by pointing out that the concept is not merely an idea residing in our mind but a metaphysical entity or reality existing outside and independent of our mind. Commenting on Aristotle's view, Gulley says, "Aristotle was right to emphasise Socrates' originality in this respect. He recognised in the problems of general definition raised by Socrates an important influence in the development of Plato's metaphysical theory of Forms."<sup>12</sup>

The forms or Ideas as thus developed by Plato are regarded as the "ground" or "reason" in terms of which individual particulars can be explained. Stace says, "The Ideas are, in the first place, the cause, that is to say, the ground (not the mechanical cause) of sense-objects. The Ideas are the absolute reality by which individual things must be explained."<sup>13</sup> According to Plato, the Ideas reside in the sense objects, and it is in this sense that the Ideas are the ground by which the world of particulars can be explained. He holds that the Ideas are the being of things, i.e., the being of things flows into them from these Ideas. When this sort of relation is ascertained between Forms and sensible objects, it is meant thereby that the existence of sensible objects is derived from their Ideas or Forms only by participation. On this view, things do participate in the Forms, for example, white objects participate in the corresponding Form "Whiteness", beautiful objects in the Form "Beauty", and so on. But Plato does not have any clear-cut conception as to what happens when a beautiful thing "participates" in the Form "Beauty". However, Crombie has tried to clarify the meaning of the word 'participation'. According to him, particular objects participating in the Forms (or universals) may be taken to mean that an individual beautiful object is an instance of Beauty rather than Beauty itself, i.e., the individual beautiful object has a share in Beauty and does not monopolise it. Now, when the object is destroyed, Beauty itself remains unaffected but the beauty of the object in question is destroyed. So he says, "In this way type-properties seem to be unchanging entities or ontia, whereas

---

12. Gulley : *The Philosophy of Socrates*, p. 11.

13. Stace : *A Critical History of Greek Philosophy*, p. 194.

token - properties are essentially transitory and perishable."<sup>14</sup> Again Plato has used sometimes the word "imitation" besides the word "participation". In this sense, an individual beautiful object is an imperfect instance of the eternal ontia which is 'Beauty'. It does not imply that a particular beautiful object is unreal, nor that its beauty is unreal. Rather it means that to assert that the thing, for example, rose is beautiful is not to assert the ontological Form or something which is true without qualifications or determinations. This shows why Plato speaks of an instance of Beauty, for example, as an instantiation of Ontia. Crombie says, "But Plato talks not only of participation, but also of imitation, the shapes of the particles in the *Timaeus* imitate the eternal ontia. There is perhaps a suggestion here that the properties of things are not only instances of universals but derivative and imperfect instances."<sup>15</sup> Thus understood, the Ideas are the originals of which the sensible objects are only the copies rather the inferior copies. In this connection, it is said that the Ideas are both immanent and transcendent, immanent in so far as they reside in the sensible objects and transcendent in as much they have a reality of their own apart from the sensible objects which participate in them. Further, one fundamental thesis in Plato's philosophy is that "participation" here means only the one way relation of ontological dependence between non-eternal sensible objects and eternal Forms. According to this view, nothing can exist in space and time with a definite character if there does not exist its corresponding Form. But the converse is not true because infinitely many Forms exist without their physical instantiations.

In so far as the sensible objects participate in the Forms, we should say here that this sort of participation in the corresponding Forms is the cause or the explanation of the sensible particulars. So the first step towards Plato's theory of causation is such descriptions as a beautiful thing is beautiful because of its participating in its corresponding appropriate Idea, viz., the absolute Beauty. On this version, what is beautiful is made so by participation in absolute Beauty, and, hence, any other kind of explanation in terms of 'colour', 'shape', and so on can not be regarded as the "causal explanation" of the beautiful object. Similarly, the difference by a head cannot be said to be the cause of a man's superior height over another, rather "Tallness" is the cause of

---

14. Crombie : *An Examination of Plato's Doctrine*, p. 47.

15. *Ibid.*, p. 47.



his being tall. Now, the clarification so far made above regarding Forms as "causes", however, appears to be incomplete as well as inaccurate. so let us consider now the problem of determining the sense of the word "cause" in which the Form 'Beauty' but not colour or shape or head of an object can be regarded as the cause of its being beautiful or of its being tall. To this, we may say that the statements in the *Timaeus* the *Philebus* and the *Phaedo* throw some light on Plato's theory of causation. The definition of cause which he has constructed in the *Timaeus* (28a) is as follows : whatever comes to be must come to be through the agency of a cause; without a cause nothing can come to be. This sort of interpretation has an important implication on the status of the sensible objects. Whatever comes to be in this sense is an existent thing which is of such a nature that it is always coming to be and so it is never is . If so, this view of causation evidently shows that everything is becoming and as such it has necessarily the cause for its becoming. Not only the *Timaeus* but also the *Philebus* has a passage which contains Plato's account of causation. According to this view, everything that is becoming or coming to be does so of necessity through a cause. Plato has introduced here the words 'agent' and 'patient' which he has identified with the concept of 'cause' and 'effect' respectively. Therefore, he has used both of them in the same sense of cause and effect, and so the difference lies only in the name. Now the intention behind calling the cause 'agent' and the effect 'patient' is that we speak of the cause as leading and the effect as following. Further, the *Phaedo* also contains Plato's discussion of Forms as causes. He has regarded the Forms as teleological causes which have been further endowed with " force" or "power" such that they bring about causation or effectuation. Huby says, "Plato, in his turn, wanted all causal explanation, all explanation of why things are as they are, to be of this one type, with the idea of purpose extended far beyond the sphere of human mental events."<sup>16</sup> However, the teleological explanation of cause found in the *Phaedo* is exemplified in the purposeful agency of a mind, while in the *Timaeus* it is imputed directly to the activity of the divine souls. But this teleological interpretation is not satisfactory because we find in the dialogues of Plato that socrates himself has said that he is still "deprived" of the teleological cause for which he was searching, and Plato is not at all in favour of the teleological cause. Vlastos says, "It is therefore, unnecessary to inquire how Plato could have assigned, without grave

---

16. Huby in *A Critical History of Western Philosophy*, p. 18.

confusion, to his Forms ... the teleological function which, both in his dialogue and in the *Timaeus*, pertains exclusively to mind or soul."<sup>17</sup> In the second place, it is argued that Plato's Forms are the efficient cause of generation in the Aristotelean sense. But this sort of interpretation appears to be unsatisfactory obviously for the reason that the concept of cause understood in this sense is in need of causal efficiency which is interpreted as having the meaning of "change" or "power to produce". If so, this standpoint goes against the notion of Forms because Forms in Plato's opinion are eternal and immutable entities which do not admit of any change in them. Secondly, the idea of efficient cause implies the idea of an individual agent who exerts power to produce an effect. Since the Forms are not individuals, they cannot be said to have any causal efficacy in the true sense of the term. This shows that the Forms cannot be regarded as "efficient causes". Therefore, the Forms mean neither the mechanical causes, nor the efficient causes nor the teleological causes.

There are, however, some scholars like Shorey, Vlastos and others who are of the opinion that when Plato speaks of Forms as causes, he has used the word "cause" in the sense of 'logical reason.' This is so because Plato, according to them, thinks that Form or concept stands for the account of the "essence" of an object to which it refers. Since it defines the essence of an object, it is what is called the logical condition of a particular sensible object, and hence the "cause" is a logical reason here. If so, the "reason" why a beautiful object is beautiful is that there exists the eternal, immutable and incorporeal Form "Beauty" in which the sensible object participates, and when it does, it is rightly called a beautiful object. In this sense, the logical cause is at the same time the metaphysical cause for a sensible object. In other words, Plato's forms like "Squareness", "Beauty", and so on represent only the 'logico-metaphysical conditions' in the context of the sensible objects because the logical relation of a sensible object to its corresponding Form under which it falls is at the same time the metaphysical relation of the sensible object to its eternal Form. Therefore, the question why this beautiful object is beautiful or why this figure is square is answered by saying that the particular object or the particular figure meets the logical condition. And it is this logical function of the Form that works as the explanatory function of the sensible objects. The implication

---

17. Vlastos : *Platonic Studies*, p. 88.

of this standpoint is that when it is said that an object  $x$  is beautiful because it participates in the Form 'Beauty', it does not have any causal import. Hence, we have to describe the Forms as having no causal efficacy. Vlastos says, "In and of itself, Plato's Squareness has no more causal efficacy than has the nominalist's; it has no power to spawn earthly squares; if it did, so would the Forms, Myriagon, and each of the countless others that have had no mundane progeny and never will."<sup>18</sup>

Shorey has interpreted this position sketched out briefly above as only the tautological logic of the theory of Forms as causes and said that Plato is interested only in providing the logical reason instead of other causes. Vlastos says, "Paul shorey, at the other extreme maintained that when Plato speaks of the Ideas as *aitiai* he is offering "only a tautological logic ... a consistent and systematic substitution of the logical reason for all other forms of cause."<sup>19</sup> According to shorey, to say that something is the case in virtue of the Form is expansible into 'in virtue of participating in the Form.' Now, if  $a, b, c,$  etc are individual names,  $x$  is the individual variable,  $F$  is the property variable and  $\phi$  is the Form variable, then the above interpretation that something is the case in virtue of participating in the Form is reducible to the following tautological logic: 'For all  $x, x$  is  $F$  if and only if  $x$  participates in  $\phi$ . Form this it follows logically that  $a$  or  $b$  or  $c$  or any other  $x$  is  $F$  in virtue of participating in  $\phi$ ,' that is to say, the former logically entails the latter. If so, this sort of interpretation offered by shorey shows that the Form as a cause in this sense is purely the logical reason of particular objects like  $a, b, c$  and so on, and, hence, it does not say anything regarding the physical causation or any other kind found in the happenings in the world. Consequently, it is equally claimed here that the misunderstanding of the sense of logical reason creates puzzles in the case of mathematical Forms. The question: 'Why does 1, added to 1, make 2?' is usually answered by saying that we add 1 to another 1, and this operation of 'addition' is a physical process which is the cause of the number '2'. But we are mistaken here because things are two or numbers are two in virtue of participating in the Form 'Dyad'. Therefore, the 'why' in 'Why do 1 and 1 make 2?' is not physical 'why', and hence we cannot get it from our description of what physically happens to objects when they are moved or placed closer to each other but from the account of the "essence" of the number '2'.

---

18. Vlastos: *Platonic Studies*, p. 92.

19. *Ibid*, p. 77.

Similarly, the group of 10 is greater or more numerous than the group of 8 because it participates in the Form 'Numerousness', i.e., it satisfies the logico - metaphysical conditions of "Numerousness". So the physical operation of addition of 2 to 8 is not the cause of 10 being greater than 8. Thus "The question whether the addition of 2 is the cause of 10 being greater than 8 is meaningless, because there is no more a cause of 10 being greater than 8 than there is of Thursday coming after Wednesday."<sup>20</sup> We can, therefore, conclude from this discussion that though there is no physical cause for such truth, yet there is certainly a reason for it, and this is what is called 'logical reason'. Sayre calls this logical reason the necessary and sufficient condition for the occurrence of a property F in a particular object x. He says, "I propose in the present section that the *alria* of a characteristic in a particular thing is the necessary and sufficient condition of its being so characterised."<sup>21</sup> In this sense, the Form as a "cause" is not merely a matter either of necessary conditionality or of sufficient conditionality. On the contrary, the "cause" is one which is jointly sufficient and necessary condition for the occurrence of a particular property F in the individual x. On this version, the presence of the Form in a particular sensible object is both the sufficient and necessary condition for that object to be what it is. And the cause which is thus jointly sufficient and necessary condition is the cause in the purely logical sense of Formal logic. So, when we say that a particular colour or a particular shape is not the cause of a beautiful thing's being beautiful, we mean that neither of them is the cause in the sense of being jointly sufficient and necessary condition, i.e., in the logical sense. That is why, it is said that the Form "Beauty" alone can constitute both the sufficient and necessary condition of a thing's being beautiful. Hence, a thing is beautiful if and only if it participates in the absolute Beauty.

Vlastos, however, does not accept this interpretation of Plato's Forms as merely a 'logical reason'. He points out that if we conclude that the formula 'F in virtue of  $\phi$ ' is interpreted as stating merely the 'logico - metaphysical conditions' of sensible objects and, therefore, it does not have any causal significance, then it is misleading. In explaining this notion of causal significance which the formula carries, Vlastos has cited

---

20. Vlastos : *Platonic Studies*, p. 131.

21. Sayre : *Plato's Analytic Method*, p. 3, footnote

such cases as "Fever" is the cause of "sickness", "Snow" is the cause of "cold", and so on. According to the formula "F in virtue of  $\phi$ ", it is said that an individual x is sick in virtue of participating in the Form "Fever", that is, the Form "Fever" makes x sick. Now, if  $\phi$  is not regarded as a cause of sickness in x, then we have to say that the Form 'Fever' cannot make x sick. In this sense, Shorey's interpretation of the Forms as cause solely in the sense of logical reason is going astray. This is so because we have to say, then, that the relation of entailment holding in such cases as 'John is sick because he has fever', 'a burning log is hot because it is on fire', 'the white stuff is cold because it is snow', and so on cannot have any causal implication. Vlastos says, "Such had been Shorey's claim when he maintained against Zeller that in the whole of this passage Plato is concerned with logic, not physics, adumbrating a theory of syllogistic inference, not of causal explanation."<sup>22</sup> Rather he holds that the relation of entailment in the formula "F in virtue of  $\phi$ " is equally a causal inference, and hence it cannot be empty of causal significance. It is clear that when Plato is speaking of the Form "Snow" as the "because" or "reason" of cold, he seems to be dealing with the causal structure of the world. This is so because it is not only that the snow of our experience is cold because the 'Form' of snow entails the 'Form' of cold but also that all such Forms are eternal and sustain immutable relations to each other. If so, the physical laws or the laws of nature must possess the same logical or mathematical necessity because of this immutable relation of entailment. Vlastos says, "And since in Plato's theory it is grounded in relations of entailment between Forms it would have to be a fantastically strong "must": it expresses a physical law that has logical necessity."<sup>23</sup> Therefore, the concept of causality interpreted in terms of this logical relation of entailment involves the relation of logical necessity between cause and effect, that is to say, it states that when two events of cause and effect are causally connected, they are connected by the relation of logical necessity. Thus understood, our conclusion is that "The cause logically entails the effect in such a way that it would be in principle possible, with sufficient insight, to see what kind of effect must follow from examination of the cause alone without having learnt by previous experience what were the effects of similar causes."<sup>24</sup> This view of causality, thus interpreted, does not appear to be acceptable to many philosophers. All most all

---

22. Vlastos ; *Platonic Studies*, p. 104

23. *Ibid.*, 105.

24. *Ibid.*, p. 106, footnote.

the thinkers belonging to the Humean tradition hold that the laws of nature are in the last analysis radical contingencies. They have called them 'de facto uniformities' or the 'special cases of still more general defacto uniformities'. Whatever it may be, some philosophers like Leibnitz, Hegel, Bradley and Bosanquet have propounded basically the similar view of causality.

When it is said that the Ideas or Forms are the causes of the world of sensible object, a question naturally crops up here regarding the exact relation among different Ideas in Plato's hierarchy of Ideas. Though there are many Ideas, yet they are not isolated units but members of a single organised system. Stace says, "Just as the one Idea presides over many individual things of which it is the common element, so one higher Idea presides over many lower Ideas, and is the common element in them. And over this higher Idea, together with many others, a still higher Idea will rule."<sup>25</sup> For example, the Ideas of whiteness, redness, blueness are all subsumed under the one Idea of colour. The Ideas of sweetness, bitterness, etc. come under the one Idea of taste. But the Ideas of colour and taste themselves stand under the still higher Idea of quality, and the Ideas in this way form a pyramid to which there must be an apex. Consequently, there must be one highest Idea which is to be regarded as Supreme overall the others. According to Plato, this Idea will be the one final and absolutely real Being which is the ultimate ground (Cause) of itself, of the other Ideas and of the entire universe, that is the Idea which he calls the Idea of the Good or the Form of the Good. Bambrough says, "Plato insists that there must be a single form which is the form that orders reality. This is his "Form of the Good". The Form of the Good is the highest form and cause; it operates both in our thoughts and in fact, and gives reality its complex systematic order."<sup>26</sup> Therefore, the world of Ideas is one single system culminating in One Supreme Idea which is the highest expression of its unity. Now the admission of the Supreme Idea as the Idea of the good shows that Plato's system is out and out teleological. Stace says, "... the teleology of Plato culminates in the Idea of the Good. That Idea is the final explanation of all other Ideas, and of the entire universe. And to place the final ground of all things in perfection itself means that the universe arises out of that perfect end towards which all things move."<sup>27</sup> This teleology is obvious everywhere in the

---

25. Stace : *A Critical History of Greek Philosophy*, p. 198.

26. Bambrough : *New Essays on Plato and Aristotle*, p. 150.

27. Stace : *A Critical History of Greek Philosophy*, p. 202.

world of sense-objects because the actual objects called sensible particulars, as the perfection is not yet reached, tend towards the highest perfection. Here we see that Plato has frequently used the word 'God' and identified it with the highest Idea of perfection or the Idea of the Good.

However, the problem also arises here regarding the causal connection holding among the Ideas in the pyramid to which there is an apex. It is found that whenever the philosophers attempt to explain the problem of the universe they have started with the unilate cause from which the whole universe has been derived. Plato seems to be no exception in this regards, and holds that this ultimate cause consists of Ideas or Forms. In this connection, there are two problems. In the first place, Plato should provide an account of this ultimate cause so that it is capable of explaining the world of sensible things. In this connection, Plato has to show that the actual world of facts is deducible from this first principle. In the second place, this ultimate cause must be self-explanatory principle, i.e., in explaining the world of facts it must also explain itself, otherwise it can not be regarded as the ultimate cause or first principle. In so far as the first problem is concerned, Plato's solution appears to be unsatisfactory. Plato says that the existence of particular objects can be explained sufficiently by the Forms or Ideas. If the Ideas are a sufficient causal explanation of the actual existence of things, then it implies that there must be in the very nature of the Ideas themselves some inner necessity which forces them to reproduce themselves in the sensible things. But the Ideas are, as Plato defined, self-sufficient, lacking in nothing. If so, then such Ideas need no further realization of their being in the actual manifestation of the sensible particulars. Thus, there seems to be in the Ideas no necessity that urges them towards reproduction of themselves, and this means that the Ideas can not be regarded as the principle for the explanation of the actually existing things. Again, if on Plato's view the cause is a Form which is changeless and eternal, then the inevitable outcome of this position is that it has no essential relation to time. Consequently, Plato has the Forms above space and time and, therefore, it appears difficult to imagine how we can significantly speak of the Form which is the cause as leading, or of the effect as following. This is because the Form as cause is no more a material cause and Plato's philosophy is not concerned with the concept of material cause at all. Now, the effects which are sensible objects are obviously something material. Consequently, matter which is not Idea stands outside,

thus leading to dualism. Since matter as a principle is quite independent of Ideas, its being is self derived and original. So, the cause which is an Idea can never become an effect, and thus it is also not clear as to how we can combine the idea of changeless Form with the idea of material objects which are, no doubt, changeable. Besides, the concept of cause ascribes to the 'Form the power' to produce an effect. But the Platonic Forms are defined as only changeless and eternal realities. While the concept of cause as the power to produce an effect certainly involves the dynamic character of the notion in question. Now, if the Form as a cause is understood in the sense of power that produces an effect, then certainly the Form must be dynamic in character and thereby it loses its unchangeable eternal aspect. Hence, it is not clear as to how we can combine the idea of changeless with the idea of dynamic power in the Form as the cause. Therefore, Plato's Forms or Ideas as the cause of the sensible world cannot explain this actual world satisfactorily.

In the second place, Plato tells us that the Idea of the Good is the Supreme Idea which is the ground of all other Ideas, i.e., the ultimate cause. But he has not shown that he has derived all other Ideas from this ultimate reality as the ground of them. If so, it means that the lower Ideas must find their necessity in the highest idea. If we can see that the Idea of the Good necessarily involves the other Ideas, then these other Ideas would really be explained, that is, if it is possible for us to deduce all other Ideas from this one idea, it would be possible for us to show that all other Ideas necessarily follow from this. This means that if we assume the Idea of the Good and deny other Ideas, it leads to self-contradiction. In this case, the Supreme Idea or the Idea of the good shall be regarded as the first principle. If so, on this interpretation, we should be able to deduce the Idea of whiteness from the Idea of the Good. But this seems to be obviously impossible. Stace says, "You may analyse the Good as long as you like, you may turn it in every conceivable direction, but you can not get whiteness out of it. The two Ideas do not involve each other. They are thinkable apart. It is quite possible to think the Good without thinking whiteness. And it is the same with all other Ideas. None of them can be deduced from the Good."<sup>28</sup> Therefore, it is impossible to deduce the idea of whiteness from the Idea of the Good, and hence it leads to self-contradiction. What

---

28. Stace : *A Critical History of Greek Philosophy*, p. 244.



is obvious is that neither the Ideas can explain the world nor they can explain themselves satisfactorily. We can say that Plato's notion of Form or Idea as the cause of sensible world is not very consistent and, therefore, suffers from some sort of impreciseness "sometimes he speaks of the cause as a Being or Form, sometimes as a force or power and at other times as an end or purpose. Perhaps he means it to be all these. But it is difficult to combine these ideas and get a clear and consistent picture of the cause. On the whole, however, he inclines towards a teleological view, but the teleology that he accepts is external teleology. As such it shares all the defects of that familiar doctrine. The causal relation on that view must be arbitrary in the last analysis, and the statement quoted above, that the cause naturally leads and the effect *naturally* follows it, loses all force and significance."<sup>29</sup> Whatever defects are there in Plato's account of causation, it is, however, clear so far that he has an intention to explain that the entire world in the causal process continuously develops towards the final cause. Consequently, the world, as Aristotle also has maintained, is well ordered so that everything in it is the best possible state. For this teleology Plato demands a perfect being or the Idea of God to whom everything ultimately owes its being, and hence this concept of causality from this stand point of ultimate cause is purely a metaphysical concept that essentially goes beyond the grasp not only of the ordinary people but also of the science in general.

Aristotle's treatment of causality cannot be kept aside from our discussion of the problem. In this connection, it should be mentioned here that though it is not so easy to categorise Aristotle as a rationalist philosopher, yet his metaphysical conception of causality throws some light on the idea of necessary relation involved in the causality. Besides his fourfold causes or "because" are ultimately reducible to Plato's Form and matter. So Aristotle's treatment of causality deserves to be mentioned here for the clarification of the rationalist notion of causality. The predecessors of Aristotle have admitted various kinds of causes. Most of them have accepted the material substance as the fundamental cause in the production of things. According to Thales, water is the fundamental substance as constituting the material cause of everything. Anaximenes accepts air as the primary substance of all things. There are some philosophers like

---

29. Bhattacharya : *Causality in Science and Philosophy*, p. 20.

Empedocles who have recognised earth, water, fire and air as the fundamental causal principles. It is obvious that all these philosophers have accepted only one kind of cause which is material by nature. But Aristotle goes against this tradition and argues that a material cause, as Aristotle argues, can not by itself generate any change or bring about any movement. For example, bronze does not change for itself or for its own accord. So it is in need of some agency which starts the motion in the substratum. This agency is called by Aristotle the "efficient cause". This shows that these philosophers [Except Parmenides] do not have any idea of the need of the efficient cause. So some of them have showed a further interest in the search for the efficient cause. Anaxagoras accepts that there is Mind in nature; it is the cause of order and arrangement in nature. Empedocles holds that good is the cause of all good things, and Evil is the cause of all evil things. While Anaxagoras accepts Mind as a kind of "deus ex machina" to create order. But Aristotle says, "It is clear, ..., that philosophers down to the time of Empedocles recognised two of the causes defined in my *Physics*: the material and the efficient. But they do so vaguely, inadequately, and rather like untrained troops in action who run about all over the field and may often get in some good blows, though not as the result of any skill."<sup>30</sup> On the other hand, Aristotle does not accept Plato's view of Form as the cause of the sensible world, for the problem crops up regarding the "participation" of the sensible objects in the Forms. When the Pythagoreans have introduced mathematical numbers as constituting the cause of the sensible world, they have interpreted it as "imitating" numbers. But whatever interpretation they offer in support of this relation, none of them has succeeded in doing so. On the one hand, the mathematical numbers of the Pythagoreans cannot built up the sensible world. On the other hand, Plato fails to demonstrate how the unchangeable forms can at all be related to the changeable particulars. Aristotle argues further that although these philosophers have admitted the causes, whether material or efficient, we cannot understand how one of these elements can alone play the role of a cause in producing an effect.

Aristotle's treatment of causality has been developed especially in his book *Physics*. The theory by which he tries to explain how things come to be is known as the theory of causality. He has classified cause into four kinds, namely, the material, the formal, the efficient and the final. First, the material cause is what we ordinarily call the

---

30. Warrington : *Aristotle's Metaphysics*, p. 63.

matter or the stuff out of which a thing is made such as "bronze", "wood", etc. In a bronze statue, bronze is the matter which constitutes this bronze statue. Now, the most essential feature of this material cause is that it does not vanish when the effect is produced but only remains (i.e., subsists) in its effect. Consequently, the material cause is something static. Secondly, the formal cause is a formula or the definition of a thing giving the principles according to which the thing is constructed. Aristotle regards it as the formal cause [of the thing] because it stands for the form or structure of the thing. This notion of cause resembles the concept of Form in Plato's philosophy. Since the form of a thing is static, the formal cause is equally static. Thirdly, the efficient cause means the relation which is like that of an agent to the thing which is done i.e., the relation of the producer to the thing produced. In this sense, a producer brings about a change from the potential to the actual. So, the efficient cause is that which is the source of power or force in order to bring about a change. Fourthly and lastly, the final cause means the end or purpose for which a thing is made or towards which the movement is directed. To make all these four causes intelligible to us, he has used the example of house-building. He says that the bricks, mortar, glass, tiles and so on which go to make up a house constitute the material cause of the house. The craftsman who puts these materials together is called the efficient cause. The formal cause lies in the plan of the architect who decides to give the house a form or a shape. This form of the house which the architect wants to provide is the formal cause of the house. While the final cause is the purpose for which this house is built, viz., that of providing shelter and comfort. Aristotle's interpretations of the four-fold causes have the implication that when there is a need to offer a full explanation of an artifact like a house, all these four causes are required. Aristotle's treatment of causality is deeply influenced by such examples which he calls the paradigms or standard cases. He holds that causality in this sense means such cases where the influence of a final cause seems most clearly at work. Here there is a conscious foresight, i.e., the notion of the final cause for the sake of which something is done, and it is called "an end in view". So, one may argue that the concept of four causes in this sense is inapplicable to the change or movement other than the planned artifact like house, machine, etc on the one hand and biological process on the other. This analysis seems to be inapplicable to such a case where a seed develops itself to a plant. It may be said that there is no conscious purpose or foresight involved here. Yet we see that there is an unconscious purpose or function in

the case of the development of a seed to the plant. We can not but admit that the final cause of the seed is the last stage of the process of its development. This last stage is called an "end in time". The Greek word *telos* carries the two meanings of "an end in view" and "an end in time". So, the final cause is not only at work in human artifacts and biological processes but also in the case of such developments. Huby says, "Thus, the final cause of a biological change like the growth of a plant came to be equated with the development of plant itself."<sup>31</sup> According to Aristotle, it is not possible for one cause to produce an effect, and hence, a single cause is necessary but not sufficient for accounting a thing being in a certain state, i.e., the change in a thing. Aristotle has described matter and form as internal conditions, and the efficient and the final cause as the external conditions. These two conditions have been regarded by him as both the necessary and sufficient conditions for the production of an effect. It is to be noted here that Aristotle's efficient cause and final cause together define cause used in English, for example, "exercise is the cause of health". In this case, exercise is to be regarded as the efficient cause of the health, while health is to be understood to mean the final cause of the exercise. Ross says, "It will be noted that of Aristotle's four causes only two, the efficient and the final, answer to the natural meaning of "cause" in English. We think of matter and form not as relative to an event which they cause but as static elements which analysis discovers in a complex thing. This is because we think of cause as that which is both necessary and sufficient to produce a certain effect".<sup>32</sup>

Now, Aristotle in his "A Philosophical Lexicon" has explained the variety of the meaning of the word "cause". The word "cause" denotes : " (1), "That from which (as immanent material) a thing comes into being, e.g., the bronze of a statue, the silver of a drinking bowl, and the glasses to which bronze and silver belong." (2) "The form or pattern of a thing (i.e., the formula of its essence), the classes to which it belongs, and its own parts." (3) "The starting -point of change or rest . Thus an adviser is the cause of an action, and a father of his child. In general, the maker is the cause of the thing made, and that which changes of that which suffers change." (4) "The end , i.e., that for the sake of which a thing is. For example, health is the cause of walking : in answer to the question, why does one walks ? We reply 'In oder to be healthy'; and in saying so we

---

31. Huby in *A Critical History of Western Philosophy*, p. 52.

32. Ross : *Aristotle*, p. 73.

believe we have assigned the cause. The same is true of all the means which had from an independent source of motion to its end. Thus, slimming, purging, medicines, surgical appliances, all lead to health; all of them exist for the sake of the end, though they differ one from another in that some of them are instruments and other acts." <sup>33</sup>

The above interpretations have the implication that a thing cannot have one cause but several causes. It has been said that both the sculpture and the bronze are causes of the thing "Statue", and none of them can be called the causes in the same sense. They are different in the sense that bronze is the material cause, while sculpture is the efficient cause. Again, a thing may be a cause in some sense while an effect in another sense. For example, "exercise may be the cause of good health, and this good health may be the cause of the exercise. Further, a single cause may have opposite effects, for example, the absence of a pilot in a ship causes the ship-wreck but his presence causes the vessel's safety. Thus, Aristotle is in favour of the plurality of causes and classifies them as (i) Proper Cause (2) Genus or Proper Cause, (3) Incidental Cause, (4) Genus or Incidental Cause, (5) Proper and Incidental Cause combined, and (6) Genus of Proper and Incidental Cause combined. However, Aristotle's interpretation of causality makes it a dynamic view of the cause. This is because his causation is one of continuity, for the cause becomes effect and in the process of causation matter adopts a new form. According to him, the whole universe is a continuous development which has its meaning in the final cause. If so, Aristotle's notion of causality is teleological. The teleos or purpose is explicit especially in the biological process or developmental phenomena. According to him, the behaviour of Nature is completely purposeful. Ross says, "The world, Aristotle is maintaining, is well-ordered; i.e. everything in it is disposed so as to assure progress towards its best possible state."<sup>34</sup> So, it is evident that Aristotle's view of causality is essentially teleological. In nature, there is in everything an innate tendency for developing itself towards some direction for which Aristotle has accepted the idea of an unmoved mover or God. Guthrie says, "A perfect being is demanded, the 'best' by which all the "better" and "worse" in this world of matter and imperfection are assessed, a first cause to which all the causes of motion and change within the world ultimately owe their being."<sup>35</sup> It is to be remembered here that Aristotle is in search for the kind of knowledge which he calls wisdom, and it is this knowledge of all these four

---

33. Warrington : *Aristotle's metaphysics*, p. 4.

34. Ross : *Aristotle*, p. 79.

causes that has been regarded as wisdom. Now it is clear that Aristotle's theory of causality is very much different from that of Plato. Plato's cause is entirely composed of Form which is a timeless logical entity, i.e. the entity which is not changed by change. Secondly, the effect here is nothing but a mere copy or imitation of the cause which is Form. If so, it implies that the effect is a false appearance of the cause. The obvious result is that the Form which is unchangeable can have no genuine connection with the effect or the sensible objects which undergo various changes. On the other hand, Aristotle's notion of cause has tried to connect matter with form, and allowed change as a factor in the notion of causality. On this version, the whole universe is a continuous development which realizes its meaning in the final cause (or God). However, Aristotle's conception of causality does not have so much importance in the field of modern science. The reason is usually two fold. First, it has been entirely a metaphysical notion due to the introduction of God as the final cause of everything. Secondly, modern science is no more concerned with the four kinds of causes as expounded by Aristotle but only with the particular or specific cause of everything. Besides, whatever analysis Aristotle provides to the notion of causality, his interpretation ultimately corresponds to his distinction between matter and form. Material cause appears to be identical with the matter of a thing, while form includes within it his notions of all the three. 'In fact, Aristotle admits that the efficient, formal, and final causes "often coincide" so that his account of causality is one aspect of his doctrines of matter and form. The material cause is matter; the formal, efficient, and final causes together constitute the form.' Therefore, <sup>it</sup> clearly shows that Plato's distinction between Matter and Form reappears in Aristotle's interpretation of causality.

## 2.2 The Later Rationalist Approach :

The later rationalist philosophers also come forward subsequently with the ~~a~~ tendency to regard causality as a concept that involves a necessary relation of the metaphysical type. These philosophers have begun with the absolute or ultimate cause to provide the explanation of the universe, that is, they claim that the existence and

nature of finite things have been derived necessarily from this one ultimate cause. Rene Descartes, C.W. Leibnitz and Benedict Spinoza belong to this later rationalist tradition. Their ideas have been developed further by their subsequent thinkers like Hegel, Bradley and Bosanquet.

Descartes' concept of causality plays a vital role in his entire philosophical system. In the opening moves in the *Meditations*, Descartes has introduced several different senses of causation. The causal considerations here seem to be based on the two types of his hypothesis, viz., the dreaming hypothesis and the evil-demon hypothesis. In the First Meditation Descartes has raised doubts concerning the "causes" of the ideas derived through our sense-perception as well as the "causes" of our beliefs or judgments, mathematical and otherwise. The sceptical doubt which is based on the dreaming hypothesis is a doubt about the causes of sensory ideas, i.e., the doubt as to whether the external material things which "cause" our sensory ideas resemble those ideas. If it is true that I am dreaming right now, then my current sensory perceptions or sensory ideas do not resemble their causes. On the other hand, the sceptical problem based on the evil demon hypothesis holds that the "cause" of my ideas of mathematical objects such as triangle, etc is an evil demon who makes my ideas fail to resemble their objects (i.e., mathematical entities). So, if the cunning and malicious demon or genius is the cause i.e., a thoroughly deceptive cause, then it makes the object appear otherwise than as the object is. Therefore, my idea may fail to resemble the object, for example, the triangle, and I may repeatedly miscount its sides. One immediate consequence is that when the sceptical doubt raised in the *First Meditation* concerns the relation between the ideas and their causes, it means the 'introduction of deceptive causes' in relation to the possibility of 'deceptive appearances'. However, Descartes in his *Meditations* has introduced the universal doubt as a method to review the entire knowledge, i.e., all our ideas about the world so far gained. And this procedure has led him in the long run to arrive at the most fundamental truth of his philosophy, namely, 'Cogito Ergo Sum' what is further called by him the basal truth or the first principle of his philosophy. Now the immediate implication of this truth, when it is first obtained, is that it has led Descartes to solipsism. This is so because there is an impassable barrier between oneself and the external physical world. Descartes has tried to solve this problem by introducing the concept of causality specially in the context of proving the existence of the Divine Being or God.

The Cartesian theory of causality is based directly on the well-known axiom "Ex nihilo nihil fit". Kemp Smith says, "As regards causality, what could be more explicit than Descartes' statement in Principles ? "When we recognise that it is impossible a thing can arise from nothing, this proposition, ex nihilo nihil fit, is not being viewed as an existing thing, or as the mode of a thing. As an eternal truth, it has its seat in our mind, and may be entitled a common notion or axiom."<sup>1</sup> This principle of causality has received a more explicit as well as a positive shape in his *Meditations*. It has been stated thus : "the reality contained in an effect must be contained either formally [ i.e., actually ] or eminently in its cause."<sup>2</sup> The significance of this statement is that by an appeal to our 'natural light' of reason we come to know that there must be at least as much reality in the cause as in its effect, because whence the effect can draw its reality if it does not get from its cause or how this cause can 'communicate' the reality to its effect if it did not itself have it. So a thing cannot arise out of nothing, and also that the thing which contains more reality cannot come into existence from that which contains less reality. Kemp Smith says, "And hence it follows, not only that something cannot proceed from nothing; but also that what contains more reality cannot proceed from what [contains less reality] ... Thus, for example, a stone which has not yet existed, cannot now begin to be unless it be produced by something which possesses in itself the same things or others more excellent than those which are in the stone."<sup>3</sup> Being armed with this concept of causality, Descartes proceeds to consider the way of investigating the cause of the ideas as stated above. There are some ideas which are considered simply as modes of thought; these ideas have no objective reality and vary widely. On the contrary, the ideas of substance contain within themselves more objective reality than the ideas which are merely modes of our thought. In this connection, we should be clear about the two notions, viz., formal reality and objective reality. Cottingham says, "According to the scholastic distinction ... the 'formal' reality of anything is its own intrinsic reality, while the 'objective' reality of an idea is a function of its representational content. Thus, if an idea A represents some object X which is F, then F-ness will be contained

---

1. Kemp Smith : *New Studies in the Philosophy of Descartes*, p. 315.

2. *Ibid.*, p. 316.

3. *Ibid.*, p. 316.



'formally' in X but 'objectively' in A".<sup>4</sup> This shows that the ideas which are merely the modes of our thought do not require 'formal' reality nor they have any 'objective' reality. But the problem is otherwise in the case of given ideas. Such an idea to possess the objective reality must derive it from the cause which has at least as much 'formal' reality as there is 'objective' reality in the idea concerned. Cottingham says, "The nature of an idea is such that of itself it requires no formal reality except what it derives from my thought of which it is a mode. But in order for a given idea to contain such and such objective reality, it must surely derive it from some cause which contains at least as much formal reality as there is objective reality in the idea."<sup>5</sup> It may, therefore, be mentioned here that we should not suppose that the objective reality which a given idea does possess need not exist formally in the cause of this idea. Cottingham says, "For just as the objective mode of being belongs to ideas by their very nature, so the formal mode of being belongs to the causes of ideas —or at least the first and most important ones — by *their* very nature."<sup>6</sup>

Now, let us deal with the problem of causation which Descartes has applied in the context of proving the existence of God. According to him, the idea by which I understand Supreme God who is eternal, infinite, omniscient, omnipotent has in it more objective reality than the ideas that represent the finite substances. Now, this idea of God is the idea of a perfect being, i.e., the idea which contains all perfections in it. Again, this idea of a perfect being is not created by me as a mode of thought but a given idea having an objective reality or objective perfection. Since the idea of God is the idea of objective perfection or reality, it requires a cause which actually contains whatever is contained objectively in the idea. Therefore, I cannot get the idea of the perfect being if it does not exist, and so God as a perfect being exists. Cottingham says, "I do not see what I can add to make it any clearer that the idea in question could not be present to my mind unless a Supreme being existed."<sup>7</sup> On the basis of the veracity of God (or the Supreme Being) Descartes proceeds to prove the existence of all objects that exist apart from God, and argues that not only he himself but also everything else have been created by God. Thus, "That the idea of God is a clear idea of possible existent is plain from the fact that we can define what we mean by God. By the name God I mean a substance

---

4. Cottingham : *Descartes*, p. 28.

5. *Ibid.*, pp. 28-29.

6. *Ibid.*, p.29.

7. *Ibid.*, p. 89.

that is infinite, eternal, immutable, independent, omniscient, omnipotent by which I myself and everything else, if indeed anything else exists, have been created."<sup>8</sup> In this connection, it should be mentioned here that Descartes is a great mathematician. So we find him being guided by the influence of mathematics at the time of his interpreting the concept of causality. It is very much explicit when he says that the effect cannot be greater than the cause or it cannot contain more reality than the latter. This is the same as the popular saying that 'nothing comes out of nothing' for if we allow that there exists something in any effect that did not exist in its cause, we must further allow that this "something" comes from nothing. In this sense, the degree of the reality in any cause can never be less than that of its effect, though the degree of the former may well exceed that of the latter. Now, Descartes admits only the type of causality which is called the efficient causality. Then we have no other alternative than to say that God is standing to Himself in the same fashion in which an efficient cause stands to its effect. This position is taken to mean that God is self-caused in a positive sense, and it is not supposed to imply the negative sense in which God is not in need of a cause. Descartes here faces two objections. In the first place, it is said that if all efficient causes precede their effects in time, then to conceive God as causing Himself in the manner of an efficient cause is to conceive Him as existing before he exists which is absurd. In the second place, it is objected that if all efficient causes are different from their effects, then to regard God as the efficient cause of Himself, in any ordinary sense of the term 'cause', is again impossible. But these two objections are not insurmountable. In this connection, there is one view of the efficient cause according to which it is maintained that if there is in an object some 'power' which is 'sufficient to make it continue to exist in future', then it is said that this power is the 'efficient cause' of the object in question. This is what is called the positive sense of the efficient cause. Since this power is not found in the idea of a body, we should say that the body does not derive its existence 'from itself'. This interpretation does not apply to God. Cottingham says, "But the fact that God, derives his existence from himself or has no cause apart himself, depends not on nothing but on the real immensity of his power ; hence, when we perceive this, we are quite entitled to think that in a sense he stands in the same relation to himself as an efficient cause do to its effect, and hence that he derives his existence from himself in the positive sense."<sup>9</sup> The same view is equally found in the argument put forward by Kemp

---

8. Haldane & Ross : *Meditation III*, p. 163.

9. Collingham : *Descartes*, p. 89.

Smith, He says, "The causality, whereby God determines His existence, is not any transeunt action, but is His "great inexhaustible power, the immensity of His power or essence"; and *in the limit* this power is co-extensible with all else that is God's essence. The universal applicability of the principle of causality is thus being consistently held to; and our right to use it in demonstrating God's existence is thereby vindicated."<sup>10</sup>

It is to be noted here that such interpretation of causality does not exclude the concept of mechanical causation or determinism in the happenings of natural events. In explaining the happenings in the world of nature, he seems to have favoured the deterministic or mechanical view but in a very peculiar manner. He has proceeded here along the line of the scientists like Kepler and Galileo, Kepler has explained the movements of the planets in terms of the mathematical laws which ascribe "determinism" to the happenings in nature. Galileo also has explained the natural events, e.g., "the falling of objects on earth" in the similar manner. On this version, all natural phenomena can be explained mechanically, and there are some fundamental unchanging natural laws underlying the mechanical interactions. Kepler claims that the laws of planetary motion are derivable from mechanics because the planets are pushed along in their orbits by a whirl or 'Vortex' of tiny material particles swinging around the sun in just the same way that a leaf is whirled around by a current of air. Descartes also regards the natural world as a single deterministic mechanical system. According to him, all the diverse phenomena are never random or isolated events, rather they are governed by the unchanging laws of nature. Hence, the interactions among the natural phenomena are always mechanistic. He holds that even the life of an animal is exactly like the working life of a machine, and the human body also is another mechanism of exactly the same kind. According to him, God is the divine clock-maker, and has created at the time of creation this world and set every part of it in motion. He says that the whole of nature which resembles the giant clock work - the seventeenth century's favourite analogy. It is ticking along until the end of the world; it is powered by an unending series of pushes and pulls, bumps and twists, shakings and swirlings. According to Descartes, God is the ultimate cause of this world whose movement is strictly deterministic under the divine influence. The persistence in existence is due to God, that is, at every moment. God creates the world afresh. Now this is the position that

---

10. Kemp Smith : *New Studies in the Philosophy of Descartes*, p. 318.

each finite thing has no hold on its existence that it requires at each moment. If so, it can not cause changes in one another. Then we are led to the most extreme form of occasionalism. So the relation between God and the world is double . First, God has created this world and set every part of it in motion, the original motion has been conserved through all the mechanical interactions which has been taking place from that day to this. Secondly, God sustains it in being from moment to moment . Therefore, the reason why, for example, some particular beam of light is reflected from a surface at an angle of 30 degree is not only because it hit the surface at an angle of 30 degree but also because God was at that time maintaining the law of reflection whereby the angle of incidence equals the angle of reflection. In the same way, the reason why a stone lying in the field continues to lie in that field is not only because no one comes along to move it but also because god keeps in operation during this period the laws which determine its nature and its structure. In this way God's 'concourse' or 'concurrence' is involved at every moment of history. Without the continual involvement of god, the clockwork mechanism of the universe will not only fail to tick but also will be chaos and nothingness. Thus, the relation what we find in the natural events, i.e., between object and its aspect is mirrored in the relation between god and the object. When we are concerned with any aspect of the object, this means that we are talking about the matter itself. This, in turn, means that we are speaking about one aspect, of God, and so we are speaking of God Himself as the only substance. Consequently, this standpoint goes in favour of the Cartesian theism.

However, the inevitable outcome of the cartesian metaphysics is this sort of occasionalism, i.e., the view that God, when required, sets every object in motion. Malebranche, one of his important successors, argues that there is nothing in the conception of finite thing that can make us believe that it can act on and produce effects in other things. This assumed power is a fiction, and therefore every philosopher has been able to conceive it as he pleased. For example, some have regarded it as a substantial form, while some have regarded it as figure and motion. But Malebranche, holds that bodies have no more inherent power of continuing in motion than continuing in existence. It means only that God maintains and 'moves' each body by creating it a new successively in different places. Malebranche thus denies the reality of motion altogether except as miraculously determined change Geulinx holds that though the

human soul is conscious, yet it cannot conceive how bodily movements are brought about, and so it cannot be the cause even of its voluntary movements. Therefore, all causality belongs to God. Now the cartesian argument to establish the existence of God as the ultimate cause of the world appears to be very much unsatisfactory. In this connection Wilson's objection seems to be important. He says, "It does not seem to me that God can be ascribed the power to make Himself actual. I even think this follows from Descartes own principles. To say that God has the power to actualize Himself is to say that His omnipotence, considered as a possible entity, is sufficient to bring about the actual existence of itself. This is to say that something considered merely as possible can have an actual effect with the same degree of formal reality as itself. And this seems a clear violation of Descartes' principle that for every effect there must exist a cause with as much reality as the effect".<sup>11</sup> Besides, we have already mentioned that Descartes has been influenced by mathematics in his interpretation of the very notion of causality. He has described it deductively in terms of logico-mathematical consequences. In a logical deduction the consequence not only follows necessarily from the ground or reason but also the consequence itself can not be greater than the ground. Similarly, the effect in the Cartesian interpretation is the necessary outcome of the cause and it cannot be more than the effect. But the unsatisfactoriness of this theory lies in the equation of the real cause with the logical ground or reason as well as in the identification of the real causal connection with natural or logical connection. While interpreting the Cartesian notion of causality, Kemp Smith in his "*The Cartesian Philosophy*" (p.72) holds that Descartes has identified cause with reason. But it is to be admitted that "rational connection" and "physical connection" are not identical because the former yields the necessary truth that justifies itself by its inevitableness for thought, while the latter is only contingent for thought because the relation here can be ascertained only empirically. But it is always argued that Descartes' theory of causality has been formulated in terms of the first kind of rational connection.

Now, in so far as Spinoza's theory of causation is concerned we, however, find that the many beings of experience have been causally explained by reference to the unique infinite substance which Spinoza calls 'God or Nature.' According to him, the concept of causality implies the strict necessity, i.e., the strict necessary relation

---

11. Wilson : *Descartes*, p. 176.

between what Spinoza calls finite things and divine substance respectively. In so far as the cause in this sense produces its effect necessarily, the very existence and nature of the effect depends entirely and logically on its cause. Now, the concept of cause in the Spinozistic system has been directly influenced by the cartesian mathematical method which Spinoza calls the geometrical method. The application of this method inevitably leads to the consequence of the identification of causality with the implication which is obviously the relation of the logical sort of dependence. Here we find that Spinoza is, no doubt, impressed by Cartesianism and he regards the logical deduction from clear and distinct ideas as providing an explanatory account of the world, as rendering the world of experience intelligible. And this point of view involves the fact that the causal relation is akin to the relation of logical implication. Now the clear and distinct idea work here as assumption or definition, and Spinoza holds that they are true. Only in such a case the logical deduction of conclusions must be infallible. "But Spinoza was convinced that each definition expressed a clear and distinct idea and that 'every definition or clear and distinct idea is true'. And if the intellect operates with clear and distinct ideas and deduces their logical implications it cannot err ; for it is operating according to its own nature, the nature of reason itself. Thus, he criticizes Francis Bacon for assuming that 'the human intellect is liable to error, not only through the fallibility of the senses, but also solely through its own nature.'"<sup>12</sup> Here Spinoza holds that the logical deduction of conclusions from the appropriate set of definitions and axioms is at the same time a metaphysical deduction and gives us knowledge of reality. So it is obvious from this discussion that the order of ideas and the order of causes are the same. And when it is asked about the truth of the assumption or hypothesis from which the conclusions are deduced, Spinoza says that the assumptions are true because the deduced system gives a coherent and comprehensive explanatory account of the world as we experience it . And, consequently, the employment of the geometrical method is also equally justified by such results.

In a logical deduction the ground or premise is in some sense hypothesis or assumption which is taken for granted. Spinoza is not willing to speak of the grounds of his logical deduction as assumptions because we find him saying in the Ethics that 'the order and connection of ideas is the same as the order and connection of things'. "In the

---

12. Copleston : *A History of Philosophy*, p. 211.

proof of this proposition he remarks that its truth is clear from the fourth axiom of the first part of the Ethics, namely, 'The knowledge of effect depends on the knowledge of cause, and involves the same'. Spinoza adds, 'For the idea of everything which is caused depends on the knowledge of the cause of which it is an effect'. It is arguable, of course, that even if we grant that to know an effect adequately involves knowing its cause, it does not follow that the causal relation is akin to the relation of logical implication."<sup>13</sup> So Spinoza claims that here we should start with the infinite divine substance which is not an assumption but an ontological reality. The argument's premise should be this divine essence or nature which is logically and ontologically prior to all our knowledge, and things, then, proceed by logically deducible stages. If all things follow from their grounds in the same way as the properties of a triangle follow from its definition then this connection between things must be that of logical dependence. Thus, the principle of causality is, on Spinoza's view, transformed into the law of identity because the effect is here understood as one of the qualities or attributes constituting the divine substance as the cause. Therefore, he has defined an effect as that which can be deduced with logical necessity from the notion of the cause. Spinoza says, "From a given determinate cause an effect necessarily follows; and, on the other hand, if no determinate cause be given, it is impossible that an effect can follow. (Ethics I, 3 & Epistola 4). Therefore, it is clear that Spinoza has tried to assimilate the causal relation to the relation of logical implication and argued that the finite things proceed necessarily from the infinite substance, God.

The question, therefore, arises as to what this divine substance is and how the finite things proceed from such a substance. When we are concerned with Spinoza's notion of substance, we find him saying that the substance is the cause of itself and of everything else, and hence it constitutes the reality of all else, supports them and produces them, and as such it is the cause of all things. It is obvious from part I of the Ethics (axiom 4.) that to know a thing, one must know its cause, and it is because the knowledge of effect depends on the knowledge of cause and involves the same. What is, therefore, implied here is that to explain a thing is to assign its cause or causes. So Spinoza has defined substance as 'that which is in itself and is conceived through itself: I mean that the conception of which does not depend on the conception of another thing from which

---

13. Copleston: *A History of Philosophy*, p. 212.

it must be formed. Now that which can be known through itself alone cannot have an external cause, and substance, then, is what Spinoza calls 'cause of itself'. This means that Spinoza's substance is completely self-dependent, i.e., it does not depend on any external cause either for its existence or for its attributes and modifications. In Part I of the Ethics Spinoza says, "I understand that to be cause of itself the essence of which involves existence and the nature of which cannot be conceived except as existing'. It follows that substance in this sense must be absolutely infinite, having an infinite of attributes. Spinoza calls this substance God who comprises in Himself all reality, and Nature is, therefore, not ontologically distinct from God, Stuart Hampshire says, "A substance, all of whose attributes and modifications can be deduced from its own essential nature, and all of whose attributes are therefore necessary and not contingent, can be described as 'cause of itself' (*causa sui*); and only such a substance can be so described. It is Spinoza's fundamental argument in Part I of the Ethics that there can be only one substance which is *causa sui*, and that this single substance must be identified with the universe conceived as a whole; this unique all-inclusive totality he therefore calls 'God or Nature , (*Deus sive Natura*)."<sup>14</sup>

It is, therefore, asserted by Spinoza that God is the creator , i.e., *natura naturans* and the creation i.e., *Natura naturata* at the same time. In so far as his logical process of deduction is concerned, the individual things (finite modes) are all necessary deductions from this single cause. So, Spinoza's reply to the question as to how things proceed from God is that here we are passing from God (*Natura naturans*) to Nature (*Natura naturata*), and the individual things and beings of Nature come into existence neither by creation nor by emanation. God does not put them forth from himself but they follow out of the necessary nature of God. This way is the same as that which we find in geometry. The things and beings necessarily come into existence from the nature of God as it follows from the nature of the triangle that the sum of its angles is equal to two right angles. So, the things that make up the world or Nature are related to God as the properties of a geometrical figure are related to its concepts, as theorems to its axioms as the deduction to the principle, which from eternity contains all that follows from its and retains this even while putting it forth. It is just this fact that they are in another, God that constitutes their lack of self - dependence. This God as their inner indwelling cause

---

14. Hampshire : *Spinoza*, p. 36.



is not a transcendent creation but *Natura naturans* over against the sum of finite things, *Natura naturata*. On the basis of Spinoza's interpretation, it is clear that all finite things are caused necessarily by God, determined by the necessity of divine nature for existing and working in a certain way. he argued that 'things could not have been produced by God in any other manner or order than that in which they were produced.

In this treatment of causality we find that Spinoza has developed with strict consistency the consequence of the Cartesian interchange of real cause and logical ground. According to him, the relation between cause and effect is not only identical with that of ground and consequence but also with that of substance and quality. Since the cause is the notion in which the effect is necessarily involved, the effect must be an inherent and permanent quality of the substance as the ground. Spinoza holds that all finite things are modes or modifications of the two infinite attributes of thought and extension of the divine substance. Therefore, all the finite things according to this principle of causality, are determined by the necessity of the nature of the divine substance, and hence exist and act in a certain manner or order. Consequently, we cannot say that all the finite things are only contingent in the sense that all of them follow contingently but not necessarily from the divine nature. God causes them necessarily in the sense that He could not omit to cause them, nor he could produce any other thing or order of things than those which he actually causes. His actions do not follow from any external necessity but is a free cause in the sense that he does nothing except that towards which His own nature impels Him, that is, He acts according to the laws of His being. Because of this necessitation the undetermined choice, inconsistency etc are excluded from God as imperfection. Thus, it is clear that in nature everything is to be rationally understood as only determined by necessary causes, and, therefore, any event in nature is a determined fact and nothing is contingent. Roth says, " *Natura naturans* is self-determining, hence *natura naturata* is determined. The constituent parts of the system, because they are integral to the system, have their place set for them. The internal economy of the whole is fixed. Thus Spinoza is led to a thorough and complete determinism. The eternal nature of the divine essence, the unique substance, *Deus sive Natura*, is revealed in the chains of causality binding the modes together."<sup>15</sup>

---

15. Roth: *Spinoza*, p. 85

We shall see later on that Hume and his followers have tried to deny this necessary connection between cause and effect, and find them maintaining that there is no such necessity in Nature. On this Humean interpretation, we have to admit that the universality and contingency in the happenings or occurrences in the physical world. But Spinoza, as we have seen, holds that there is neither this contingency, nor any uncertainty in the happenings of Nature. On the contrary, the whole world is a single causal system with its finite individuals connected like the different propositions in Euclidean geometry. Joachim says in support of Spinoza's position thus, "There is no change, no possibility of anything having been (or being) otherwise. The existent order of the universe and the existent nature of its component elements, not only is, but must be, what it is, and not only must be granting certain, starting points, but must have been - could not possibly have been otherwise."<sup>16</sup> So the relation between cause and effect is necessary and inseparable; the effect comes into existence or being because of the latent qualities which were in the nature of cause, and such a determinism logically follows from the power of God. Here Spinoza holds that we have no capacity to understand this causal system as a whole but understand it step by step, that is, only gradually. When Spinoza holds that in the unity of Nature everything is to be regarded as essentially the effect of some cause, it is a thesis of scientific optimism and an invitation to rational investigation. But what is very much unsatisfactory here is his metaphysical contention regarding the concept of causation. The very foundation of this concept is Spinoza's concept of substance, i.e. God from which everything follows with metaphysical necessity. But such a contention seems to be not so significant to us because this view of causality is erroneous; the error in question arises as a result of the confusion of two aspects, viz, the logical ground (ratio) and the real cause. Spinoza has compared the dependence of the effect on its cause to the dependence of a derivative principle on that from which it is derived. Not only he did this but also he fully equates the two. He thinks that logico-mathematical consequences are identical with the essence of real effects. Besides, only the temporal sequences found in the world system can be discovered through our observation, and the causality in the metaphysical sense is not available to us through observation, that is, on the basis of empirical data. But modern science and epistemology favour the investigation into the concept of causality on the basis of empirical facts.

---

16. Joachim: *A Study of the Ethics of Spinoza*, p. 603.

In so far as the concept of causality is concerned, the standpoint of Leibnitz differs from those of Descartes and Spinoza, for he does not think that the world is a unitary whole which is simply deterministic in nature. Leibnitz holds that they have failed to distinguish between a clock and a cat or live body of a human being. For him, a clock is a mere collection of parts, whereas both the cat and the live human body are organisms. An organism is a being of a completely different kind; it has the capacity to initiate motion, to act purposefully, to react to stimulus and to reproduce. But the special significance of what Leibnitz thinks here is that an organism is a unitary whole. though the parts of the body are physically separated, yet they are still parts of the same organism. Consequently, Leibnitz holds that the fundamental units of nature are organisms as they alone can have true unity. Thus, he has sided with the vitalists whose understanding of nature is modelled on the purposeful, vital forces of living beings and who see life every where. This vital force is to be understood only in terms of the life principle striving for perfection. Hence Leibnitz's interpretation of causality involves the notion of teleology. Each unit as the subject of God's kingdom is contributing to the fulfilment of God's plan for the moral perfection of the universe. And this is the goal in life to raise each and every unit to the state which is as close as possible to the divine perspective. Leibnitz has interpreted God as the perfect clock-maker whose clocks (units) keep perfect time with each other to eternity, and do not need to be connected to each other or adjusted again as we find in Descartes' occasionalism.

Thus the concept of causality receives a very peculiar shape in the hand of Leibnitz. According to him, causality is one of the most basic well founded phenomena in his metaphysical system. It is to be attributed to monads, and the cosmic process, he holds, follows a teleology. "Leibnitz felt that no account of natural phenomena could be regarded as finally satisfactory unless it explained the reason as well as the mode of generation of such things. The leading motive, therefore, in his mind was the reconciliation of the mechanical and teleological views of the world."<sup>17</sup> So Leibnitz has replaced the inorganic corpuscles of science by "entelechies" or psychic forces and looked upon the mechanism of the cosmic process as the means and phenomenal form by which "the living content or import of the world realizes itself." This shows that Leibnitz is not ready to regard cause as a mere being or modification of such fundamental quality. If

---

17. Bhattacharya : Causality in Science and Philosophy, p. 56.

so, the cosmic change which is acquired in this way takes on the meaning of force. Consequently, the mechanical system of motions reveal itself as the external expression of an eternal creative force. Leibnitz holds that primal essences or forces which he calls monads constitute the whole of reality. These are infinite and each is windowless. It can neither influence nor be influenced by anything other than itself, yet at the same time each monad reflects the whole universe, and contains its whole past, present and future within itself. and inspite of their diversity act in perfect unison because of the law of pre-established harmony inforced by the Monad of monads(God). The world is the expression of the purposes of God. On this version each monad is separately "programmed" for the whole of its history. If so, then it may mean that there is no causal interaction. The only interaction between monads arises in the reciprocal "perception" built into their mutual accord by pre-established harmony. The only thing monads can do in relation to one another is to perceive and to agree in their successive states. Rescher says, "In the system of Leibniz causality is definable strictly in terms of monadic perception - when two monads come to have a state of agreement that one in whose state this accord is inscribed more sharply, i.e., whose perceptions of the common transaction are clearer, is the active one, and the other the passive one in a strictly figurative" causal interaction. Leibniz writes : Thus action ( or : activity) is to be attributed to a monad in so far as it has distinct perceptions, and passivity in so far as its perceptions are confused."<sup>18</sup> Leibnitz in his "Monadology, sect. 49 says that action or activity is, thus, to be attributed to a monad in so far as it has distinct perceptions, and passivity in so far as its perceptions are confused. However, in the correspondence with Arnauld this conception has been developed elaborately. He says, "This independence however does not prevent the inter - activity of substances among themselves, for, as all created substances are a continual production of the same sovereign Being according to the same designs and express the same universe or the same phenomena, they agree with one another exactly; and this enables us to say that one acts upon another because the one expresses more distinctly than the other the cause or reason for the changes....,"<sup>19</sup> The principle of sufficient reason has an important value in the context of Leibnitz's conception of causality. He formulates this principle of sufficient reason as the general demand of reason for explanation. Latta

---

18. Rescher : *The Philosophy of Leibniz*, pp. 83-84

19. *Ibid.*, p. 84.

in his *Leibniz* (p. 238) says that according to Leibnitz the efficient and the final cause combined make up apparently the sufficient reason. But he sometimes holds that the efficient causes are ultimately dependent on final causes. In explaining this position, Russell says, "But we shall find that there are really two principles included under the same name, the one general, and applying to all possible worlds, the other special, and applying only to the actual world. Both differ from the law of contradiction, by the fact that they apply specially - the former, however, not exclusively - to existents, possible on actual. The former, as we shall see, is a form of the law of causality, asserting all possible causes to be desires or appetites; the latter, on the other hand, is the assertion that all actual causation is determined by desire for good. The former we shall find to be metaphysically necessary, while the latter is contingent, and applies only to contingents."<sup>20</sup> The part of the principle of sufficient reason which is metaphysically necessary which applies equally to actual and possible contingents is the part which asserts all events due to design. The relation between cause and effect can not be a purely external one; the cause must be always in past a desire for the effect. This form of causality is the essence of activity which Leibnitz declares to be metaphysically necessary to substance. Now, if in the world of the "windowless" monads neither is influencing nor is influenced by one another, then where is there room for causal relation? Leibnitz holds that we attribute activity to that substance whose expression is the more distinct and we call it cause. Thus, when a body passes through water, there is an infinity of motions of the water. We say that this body is the cause of the motions, because by it means we can explain distinctly what happens while it is really inexplicable how the body can make ripples or motions in water unless God has ordained it. Thus, in the last analysis the agreement of all the phenomena of the various substances comes only from this, that they are all productions of one and the same cause, God, and consequently each individual substance expresses the resolution which God has taken with regard to the whole universe. Thus, in the last analysis the efficient cause is, at the same time, the final cause. Here Leibnitz quite consistently holds the freedom of the will, and it is not undetermined choice. We do not act merely because we must but because the internal nature of things makes it impossible to do otherwise. We act towards the end or ideal which is the best among various possible courses of action. Thus, our will is determined

---

20. Russell : *A Critical Exposition Of The Philosophy Of Leibniz*, p. 30

not by a metaphysical necessity but by a moral necessity. This clearly shows that Leibnitz has tried to solve the problem in the manner of Aristotle. Thus, we see that the combination of cause with because in the sense of logical ground is not satisfactory. Logical reason reduces entailment or implication to timelessness, while cause is the temporal antecedent of the effect. It becomes a because only in the sense that there is a motive or purpose in each monad.

We have thus faced some inevitable metaphysical problems in Spinoza's monistic conception of causality. But we do find some sort of different, though not radically, approach in the Hegelian concept of causality. Hegel accepts the view that the concept of cause contains energy, and a cause transmutes its energy in its product called effect. Now, <sup>Hegel</sup> Hegel contends that this idea of cause and effect gives rise to so many controversies because this way of interpreting the causality leads us to regard both cause and effect as two distinct and independent things, and this is our wrong supposition. If both cause and effect are independent, then when a cause produces an effect and transmutes its energy to its effect, it does so only by being impelled by some other cause which is alien to itself. Now this alien cause itself is, again, an effect that is obviously in need of another cause which is alien to it to be produced, and this process goes on ad infinitum. It is equally an undeniable fact that Hegel himself is well aware of this regress problem which is thus shown to be involved in the so called concept of causation. Under these circumstances Hegel proposes to admit one real cause to combat the problem of infinite regress. He argues that the series of the cause effect relation can not go back indefinitely but must originate in a free and spontaneous First Cause whom he calls 'Begriff'. Now this First Cause, that is, Causa Sui in the Spinozistic term is not only self-active but also self-determining cause. The cause produces the effect and this process from cause to effect is the process of self-separation. In this process of self-separation the cause by itself is a self-activity which determines itself. This shows that in each and every causality or causal activity Hegel's Causa Sui exists as *neshus*. So the process from cause to effect is spontaneous and self determined; it is necessitated by the inherent nature of the Causa Sui. This happens because the substantiality presupposes this sort of spontaneous process of self-activity. Further, what is most important in the Hegelian concept of causation is that he does not speak of any distinction between cause and effect the distinction which is primarily

responsible for the rise of the problem of infinite regress. Findlay says, "In the treatment of Causality which follows, Hegel rather perversely emphasizes the *identity of content* between the Active Causality exhibited by one Accident and the merely Passive Consequence shown by another. An Effect, he holds, can by its notion contain *nothing* that is not contained in its cause, and vice versa."<sup>21</sup> According to him, the logical status of cause and effect is the same; a cause is both the subject and the object. Since the process from cause to effect is a self-determining process a cause is obviously a subject when it determines the effect, it becomes an object (effect) as it is determined. Now, Hegel speaks not only of the relation of sameness (or identity) between cause and effect but also of another relation which he calls the reciprocal relation. This standpoint shows the problem of causality that arises regarding the acceptability of the temporal factor in the relation. Findlay says, "This conclusion explains and justifies Hegel's puzzling indifference to the temporal aspect of Causality, an aspect generally thought to be of its essence. Within the limits of the single causal transaction the Cause is to all intents and purposes contemporaneous with the Effect."<sup>22</sup> Now Hegel shifts himself from the notion of identity in causality to that of reciprocity. Findlay says, "From the notion of Causality Hegel now passes to the notion of Reciprocal Interaction (*Wechselwirkung*), the third member of Kant's famous trio of the categories of 'Relation'. We are no longer to think in terms of a single substance of whose nature changing states are the evitable outflow, nor in terms of substances, and exerting on each other an endless interchange of influence. We are to think rather of substances as *conspiring* together to move in a common direction and to contribute to a joint result. This notion, with its total symmetry, brings out what is only implicitly present in the seemingly asymmetrical notion of Cause and Effect".<sup>23</sup> A determines B to determine A again, or in short, A determines itself through B, and B determines itself through A. This sort of interpretation of the concept of causality does indicate all along that Hegel is in favour of the logical strictness between cause and its effect, and has, thus, tried to solve the causal problem equally by an appeal to the metaphysical necessity originating in the *Causa Sui*. Consequently, the very same style of thinking that we found out earlier in the Spinozestic concept of causality reappears in the Hegelian interpretation. B.K. Bhattacharya says, "Hegel emphasises the distinction between "the end or final cause

---

21. Findlay : *Hegel : A Re-Examination*, p. 216.

22. *Ibid.* p. 218.

23. *Ibid.* p. 218

and the mere efficient cause (which is the cause ordinarily so called)". Causes properly ~~to~~ called belong to the sphere of necessity, "blind and yet not laid bare". He does not throw any light on the problem of causation which worried Hume and Kant. In his view the cause is at once a ground and an end so that the causal relation is both purposive and necessary. He delights in paradoxical explanations, but the element of teleology really melts away at the touch of necessity which is logical and timeless. Indeed his views when rendered strictly consistent become a restatement of Spinoza's and it is useless to spend further time over the discussion of his treatment of causality."<sup>24</sup> If so, we should not hesitate to say that the problem which was focussed in connection with the Spinozistic notion of causality arises here again in Hegel's treatment of the concept.

Bradley in his treatment of the concept of causality seems to have taken a step forward than Hegel. We have seen that Hegel's analysis of the concept of causality has led to the discovery of the infinite regress vitiating the so-called notion of causality. According to Hegel, the cause which produces an effect is itself an effect which is produced here by its alien cause. Now this alien cause itself is an effect of some further alien cause which is again an effect of some other alien cause, thus leading inevitably to the infinite regress. This happens only when the cause and the effect are regarded as two independent existents. The relation in this case is not possible to be established. Consequently, Hegel has tended to identify these two concepts, and bounded them with the metaphysical necessity originating in the notion of 'Causa Sui'. But Bradley points out that here also a problem crops up immediately after when Hegel identifies the cause and effect. According to Bradley, if it is said that the cause and the effect are only identical, then it is obviously meaningless to introduce a distinction between cause and effect and use the different names. Therefore, the relation between cause and effect is such that the attempt to prove it immediately involves a self-contradiction. We cannot escape ourselves from this puzzling situation, and we have to go for either of these two horns, but in any of these cases the problem appears to be insurmountable. It is because of these problems that Bradley has tried to provide a consistent account of the concept of causality. To him, the cause is, no doubt, the invariable antecedent to the effect and the effect always succeeds the cause. This is a law of such a sequence of phenomena, the law which we accept universally. Therefore, it is obvious that the

---

24. Bhattacharya : *Causality in Science and Philosophy*, pp. 146-147.



cause is to be regarded as the invariable antecedent in this law of sequence. Here Bradley means by the word 'invariable antecedent' not any 'unvaried event'. An event is said to be unvaried when we see that throughout a collection of instances it happened in time before the happening of something else. The antecedent cause in Bradley's terminology is not to be understood in this sense of an unvaried event. On the contrary, he means by the invariable antecedent the hypothetical datum out of which there comes a necessary consequence. Thus, the cause is certainly the invariable event but it is that to which, supposing that if happens, something else will succeed necessarily. To express it more logically, Bradley has identified 'cause' with 'because' or 'reason'. Thus, when it is said that 'A causes B', thereby we mean to say that 'A' is the 'because' or 'reason for the happening of 'B'.

Now, Bradley has further discussed the problem of identity of cause with because or reason, and divided the question regarding the identity into the following way : (a) Is the cause a because ? and (b) Is every because a cause? In so far as the first question is taken into consideration we see that it receives a positive answer. It is Bradley's argument that a cause is identical with reason or because which is the ground of effect as the premise is the ground or reason for the conclusion. In any inference we depend on the reasoning process of arriving at a conclusion from the premise. In the same way, we get the idea of the cause on the basis of the reasoning process, that is, on the basis of connecting the cause and the effect by reason, and as such this relation is rational. Here Bradley has tried to make explicit two aspects of the concept of causality. In the first place, the causality is not mere a constant conjunction which we find in the case of the sequence of events. He holds that there is a principle in such a succession. This is nothing but the connection between the cause and the effect like the causal connection which we find in this situation as 'A is the cause of B'. In the causal incident or occurrence like the above, we do not get the relation through the senses. Rather, we see complex situation, and then single out the relation from it, we get this causal relation only on the basis of intellectual abstraction from the particular complex facts. In the second place, the cause, the effect and their relation are not phenomena existing objectively in the outside world. On the contrary, they exist in our idea of the universal law (e.g. in 'A is the cause of b') and hypothetical inference or hypothetical assumption. This is because to know the law of causation is to know the

*Abstraction*

consequence of a reasoning by **abstraction** from a complex causal situation. When we say that 'fire is the cause of burning', we, according to Bradley, mean to say that 'fire' is the 'reason' or 'because' for burning, and we connect the two by means of reasoning or inference. In so far as the relation between premise and its conclusion of which an inference is composed is a logical relation, so also the relation between cause and effect is a logical one, and hence, this relation is necessary. Bradley says that 'to recognize a succession as a causal sequence means to perceive the facts as a presented law. And to see the law in the facts is to unite the facts by an ideal principle, and this is to reason. In other words, to say this phenomenon B was the effect of A, implies the perception of an ideal connection between A and B. But to know by means of ideal connection is to know that the fact a result of that connection. And this must be inference. It may be latent and unconscious, yet still it is there. The mere conjunction has become a connection, felt as such. And this conjunction is now used with other conjunctions. But, if so, the facts are united in my mind because of an universal'. Thus, the very idea of causation is to be regarded as the process of abstraction from the experience of the particular facts, and hence it is our mental construction or ideal construction. This shows that nothing exists in the actual world like causation as such but only with reference to the ideal or mental construction, and Bradley calls it also an intellectual construction.

Now, in so far as the second question is concerned. Bradley does not accept that every 'because' is a cause, and the reason which he thinks is that the cause and the because cannot be regarded as the same sort of specific background. In this connection, what he wants to state is that whenever the premise represents a reality in time, which has actually its own necessity, goes into a construction - whenever that construction is real, and the quality or relation, that appears in the conclusion, is its immediate result - in these cases and in these cases alone the because and the cause must be identical. While the difference between them arises when we go under arbitrary choice, and hence, 'because' is not always the 'cause' in our reasoning process. But in the sense of the identity of 'because' and 'cause' as we have already mentioned above, the process of achieving a conclusion is the same as the process of connecting the cause and the effect. In the first case, we infer the conclusion from the given premise. In the second case, we infer the causal relation from the given particular event,

and it achieves the universality on its basis . Thus Bradley is not concerned with the physical aspect of causality ; cause and effect have, as we found earlier, no ultimate existence in the physical or objective world. What we have seen is that they are our mental constructions or ideal in nature, and as such they are <sup>non-physical</sup> non-physical or appearances. Then the question arises as to why this causation is required. To this, bradley's reply is that we are in need of causation in order to provide a rational explanation of the changes in the phenomena. Bradley holds that causation is only the explanation of change, and bases this sort of causal explanation on the act of national thought as already explained. One thing should be kept in our mind that we know something about such causation on the basis of reason but we never understand the entire process of change or acausation. Bradley says, "There must, in other words, be a reason for the 'change'. But the endeavour to find a satisfactory reason is fruitless".<sup>25</sup> This account of causation as put forward by Bradley seems to be not different in any important respect from the ordinary on common sense view of the concept. The commonsense view is based on the reports of sense-perception, and maintains the idea of causality is derived from perception. In our experience we see directly that butter when placed before the fire surely melts, and also know that this causal relation between 'fire' and 'melting of butter' is a universal and necessary relation. But one more important thing deserves to be mentioned here <sup>is</sup> that Bradley, though he has based his causation an experience, cannot be regarded as an empiricist philosopher because he argues that causation is equivalent to reason. Therefore, his theory of causation is thus connected with what is called rationalism; it is rather factually based rational system. This is because we gather facts on the basis of experience, and then unite and <sup>systematise</sup> systemise them logically, that is, by reason.

Bosanquet is a follower of Bradley and, therefore, he has not been able to be free from the influence of Bradley's thought. According to Bosanquet, cause and effect are not independent events in time, and , therefore, the cause is not to be regarded as the antecedent in time. On the contrary, they are identical and this is a thesis which Bosanquet has established in his philosophy. He has tried to interpret this by reference to the hypothetical judgement. According to this standpoint, the cause is the antecedent just like the antecedent of a hypothetical judgement. In a hypothetical

---

25. Bradley : *Appearance and Reality*, p. 46.

judgement when the antecedent is given, the consequence follows necessarily and logically. In the same way, the antecedent cause in the causality is such a hypothetical datum that when the antecedent cause is given, its consequence follows necessarily. Consequently, Bosanquet, like Bradley, has also equated 'cause' with 'reason'. When we say that 'A is the cause of B', it means thereby that 'A' is the 'reason' for the happening of 'B'. He refers to Mill's interpretation of causality. According to him, Mill has defined cause as the antecedent condition in time and is the prior to the effect. But this attitude leads to the Fallacy of the plurality of causes. In that case, we cannot say, for example, "Pull the trigger - cause - and the gun goes off - effect. This will imply that the cause is a system of all the conditions related to the effect. Again only the essential and invariable conditions enter into the cause if the cause is invariable as it is claimed by Hume. But it results in Paradoxical situation because nothing save the gun powder can be regarded as essential to the effect. The implication is that this essential antecedent is less than any combination of real " Things" which produce the effect. Bosanquet says "*So, if the cause means something real* , as a material object is real, it cannot be invariable and essential. If it is not something real, and is essential, <sup>it</sup> ~~at~~ fires down into a reason or law - the antecedent in a hypothetical judgment".<sup>26</sup> According to Bosanquet, problem can be solved by equating both cause and reason with the complete ground which is the nature of a system of reality where causation is operating. Bosanquet says, "We can only escape this by identifying both cause and reason with the complete ground, that is, the nature of a system of reality within which the cause and effect both lie ; But even then, though the ground is *real*, it is not antecedent in time."<sup>27</sup> In this connection, he says, "Reality being a system of reciprocally determining parts, every part or feature of reality may be regarded as a consequent to which some other part or parts, or ultimately the whole, stands as ground. Every consequent, this law tells us, has a ground from which it necessarily follows. Necessity indeed means nothing but the inevitableness of the consequent when the ground is given".<sup>28</sup> Thus, the cause and the effect are not the isolated events, rather the relation between the two is necessary or logical. But this sort of necessity is only ex-hypothese conditional; the necessity which is rooted in a ground is a fact. So this necessity is only a sort of real necessity and never an absolute necessity. But this does not imply that the world has

---

26. Bosanquet : *The Essentials of Logic*, p. 165.

27. *Ibid.*, p. 165.

28. Bosanquet : *Logic or Morphology of Knowledge*, p. 215.

lost its rational coherence. As Bosanquet says in his *The Essentials of Logic* (pp. 164-66) that the cause and the effect are not isolated events, rather it is a rational system of nature. In this system the cause takes place and the cause includes the effect. We understand this only by means of intelligence. He says, "The universe is a rational system", taking rational to mean not only of such a nature that it can be known by intelligence, but further of such a nature that it can be known and handled by *our* intelligence."<sup>29</sup> Here also we find the tendency in Bosanquet to equate objective necessity in the causality with the rational one and thus convert it into that which is nothing but mental construction as we find in Bradley. But the causal relation is not like the relation between a premise and its conclusion, the sort of relation which we ~~establish~~<sup>establish</sup> rationally or logically. This is really an issue which has disturbed many philosophers from the very beginning of the treatment of causality. This is because one proposition in this case entails or implies another proposition such that the assurance of the truth of the former warrants equal assurance of the truth of the latter. Aristotle himself also feels this problem that the premise as a logical reason is without any causal efficacy. Since this entailment is a relation whose relata are abstract items, he does not even imagine that the premise *causes* the conclusion. Consequently, he finds that ~~it~~<sup>its</sup> defense is Otiose. Obviously, the real objective cause or ground is different from the ~~logical~~<sup>logical</sup> ground, and so the relation of dependence between cause and its effect is certainly different from the logical dependence which we find between a premise and its conclusion. It seems to us that Bosanquet has made a mistake by identifying the real cause with the logical ground, the mistake that we have found in the spinozistic theory of causality. Thus, the rationalist approach in handling the problem of causality inevitably leads to the impossibility of making a compromise between the rational or logical necessity and the objective necessity in the causation. If we, like the rationalists, stick to the sort of logical interpretation of causation, then cause and effect and also the relation between them have their seat only in our mind or reason. But rational connection and physical causation form two distinct kinds of knowledge the former yields necessary truth that justifies itself by its inevitableness for thought, while the other gives us contingent truth which can be ascertained only empirically.

---

29. Bosanquet : *The Essentials of Logic*, p. 166.

## CHAPTER - III

### THE CONCEPT OF CAUSALITY AND EMPIRICISM

#### 3.1 : The Early Empiricist Approach

I shall be concerned here with the discussion undertaken specially by the British empiricists. The trend which I have called 'Early Empiricist' is associated chiefly with the names of Francis Bacon, John Locke and David Hume. There is also another more important contributor, Mill, who has extended the view of causality very far. In our previous discussion, we have already noticed that the Rationalist tradition has insisted on the view that causality is positively a logical relation between cause and effect. As diametrically opposed to the rationalists, the empiricists in general contend that the so-called logical or necessary relation supposed to be implied by the notion of causality appears in the long run to be obviously groundless for the simple reason that it is not available through our sense-experience. What such observation reveals to us is that causality involves a mere constant conjunction in the succession of events. Bacon's *Novum Organum* (1620) throws sufficiently his reflection on the notion of causality. The word "Cause" as Bacon has conceived here receives two sorts of meaning. In the first place, he has identified the word "cause" with the word "form" or "essence" but explained it differently from Plato's interpretation. According to Bacon, the "form" is an aggregate of primary or underived qualities from which other qualities are derived in the way in which effects are deduced from causes. In the second place, he has used the word 'form' to mean the "law" by virtue of which a phenomenon manifests out of its pre-existing condition. In this sense, this form is the law that governs the process by which a quality on a body comes into existence out of its pre-existing state. This shows that Bacon has used the word "Form" to stand for the word "Law" or "Cause". These two sorts of interpretations which Bacon has provided in connection with the concept of causality

are in fact, not different from each other because both of them carry the same sense that the qualities or bodies as effects arise from the primary or underived qualities as causes, and hence the two senses are not irreconcilable. The attitude adopted by Bacon has an important consequence that goes against Plato's conception of Forms or Ideas as causes. The Platonic Form is purely an ontological entity, while Bacon does not admit the existence of such entities which exist apart from matter. His Forms as causes are always related to the material effects such that they do not have existence apart from the latter. However, Bacon has tried to specify the sense of causality by using the word "Natura Naturans". The word "Natura Naturata" indicates the present condition of a given quality or a body at a given time, while the word "Natura Naturans" stands for the immanent cause of the condition of the quality or the body in question. Thus understood, "Natura Naturans" stands in relation to "Natura Naturata" in the same way in which a cause is related to its effect.

According to Bacon, nature in which we live and have a being is nothing but a composition of individual bodies with the individual manifestations by a causal law. So, to discover Form is to discover the latent causal process in every generation and to discover at the same time the real nature of quiescent bodies. He claims that the causal laws according to which the individual objects manifest themselves is the proper object of our knowledge, and hence the adequacy of knowledge depends on the discovery of causes. So any knowledge is inadequate if it is not the knowledge of causes in the sense mentioned above. According to Bacon, the knowledge of such causes can guide us both in theory and practice, and consequently our theory as well as our practice is correct in so far as it depends on the discovery of Forms. The implication of this position is that the person who apprehends the Forms, law or cause can know the unity of nature in substances. But this does not show that Bacon accepts Aristotle's fourfold causes - the material, the formal, the efficient and the final. In this connection, one important question is how we can discover the causal relation. To this, Bacon has spoken of the method of induction which he calls the method of elimination or the method of exclusion. His basic contention is that it is

not possible to establish the causal connection only by observation of a number of agreeable instances alone because it may be shown to be false by a subsequent single "negative instance". If we proceed directly to establish causal laws, we face a lot of problems in many cases. So Bacon's opinion is that only the negative instances can help us to do so in such cases and that can do so only indirectly. So we are in need of eliminating such negative instances. Since the causal laws are the laws between the generating and generated natures, we have to observe the correlation between them in their various modes of possible occurrences. He insists that on the basis of induction we can establish the causal relation and can claim it as true if the generating nature or cause is co-present, co-absent and co-variant with its corresponding effect. So we have to arrange the evidences which we collect on the basis of observation into the three sets of presence, absence and variance. Though it is claimed that this method can help us to find out the real cause, yet there is a difficulty in so doing because it does not work everywhere. Since Forms are observable, we can specify the cause. But we cannot do this in the case of complicated physical sensation because the physical conditions here are not observable. Therefore, we can unhesitatingly say that Bacon's method of induction cannot help us to single out a real cause in the cases stated above. The suggestion given by Bacon is that we have to take the help of intellect to collect the evidential instances to single out the cause. But Bacon here seems to be going astray from his own empiricistic standpoint and taking the help of rationalism. Kneale points out that this recourse to intellect is nothing but an anticipation of a hypothetical method which cannot help us to go very far. He says, "This doctrine of *intellectus permissio* is in effect an anticipation of the hypothetical method in natural science and a confession that we cannot go far by the use of his tables."<sup>1</sup> Thus the Baconian position appears to be weaving between empiricism and rationalism. This is so because when the empiricistic tool is found to be incapable of collecting the suitable evidences to discover the real cause, he tries to take the help of intellect. But the

---

1. Kneale : *Probability and Induction*, p.53.



unwelcome situation is that intellect is not free from its own limitation and therefore the real cause goes beyond our human discovery.

Locke who comes next to Bacon in the British empiricist tradition admits that the idea of cause, which he calls "power", is not obtainable through our experience, for what we get through our experience is only the sensation of it. So, we have two questions in this connexion. First, what this cause is in the sense of power as understood by Locke himself and, second, how far we can know this cause in the sense Locke himself understood. In so far as the first question is concerned, Locke's answer is that the causal relation is the expression of power. He says, "The mind being everyday informed, by the senses, of the alteration of those simple ideas it observes in things without; and taking notice how one comes to an end and ceases to be, and another begins to exist which was not before; reflecting also, on what passes within itself, and observing a constant change of its ideas, sometimes by the impression of outward objects on the senses, and sometimes by the determination of its own choice; and concluding from what it has so constantly observed to have been, that the like changes will for the future be made in the same things by like agents, and by the like ways; considers in one thing the possibility of having any of its simple ideas changed, and in another the possibility of making that change; and so comes by that idea which we call *power*."<sup>2</sup> For example, fire has the power which can melt gold, and gold has another power to be melted. Now, this power has two aspects, viz, a capacity to make changes and a capacity to receive changes. The former capacity is an active power and the latter one is called a passive power. In the above example, fire has the active power to melt gold, and gold has the passive power to be melted by the fire. Locke ascribes certain features to this powers. First, this active power does possess freedom such that the power acts freely and acts by virtue of its own capacity. The active power produces motion, for example, our 'will' is a case here. On the other hand, the passive power does not have any

---

2. Locke : *An Essay Concerning Human Understanding* , p. 135.

such freedom but possesses two sorts of features, viz, receptive capacity and transmitting or communicating capacity. In the first place, the passive power receives motion only by being directed by some external force. For example, a ball at rest does not have an active power to move. But when it gets the stroke of a billiard stick, it is in motion. So this motion in question is not in any way an action of the ball, rather it is in motion by the external force of the stick. In the second place, this passive power of the ball again transmits this motion to any other substance or body. The ball which is thus previously in motion by the force of the stick sets another ball in motion that lays in its way. Here this ball only transfers but not produces motion which it had received earlier from another. Therefore Locke argues that whatever produces something is the cause and that which comes into being or existence by the operation of the cause is the effect. Locke has classified effects into four kinds; viz., "creation" "generation", "making", and "alteration". When the effect is entirely new, it is called "creation". When the effect is made out of something, it is called "generation". When a production is that of artificial things, it is called "making". Lastly, when an effect is produced which did not exist previously, it is called by Locke "alteration".

Now the question is : How can we know this causal relation ? According to Locke, we get the idea of cause and effect from the observation of the constant changes in things around us. We see that new things are beings constantly generated out of something else. This idea of change is a concomitant of all our experience, sensory experience as well as introspective experience. Our mind is informed everyday by senses that one thing comes into being and sometimes ceases to be, while another begins to exist which was not before. When we reflect on this matter of change in the phenomena, we desire the idea that like changes will happen in the same thing in future by the operation of the same agent and in the same way. Locke says, "... that the like changes will for the future be made in the same things by like agents, and by the like ways; ... and so comes by that idea which we call power".<sup>3</sup>

---

3. Locke : An Essay Concerning Human Understanding , p.135.

Thus we only observe that several particulars, both qualities and substances, begin to exist, and that they receive their existence from the proper operation of some other being. This observation provides our idea of cause and effect. But the troubles arise the moment we are concerned with the second question regarding "power". Since sensation cannot give us the idea of "power" but only the sensation of the particular state of change, we cannot go very far to find out the "power" which is the real foundation of causality in Locke's philosophy. However Locke's theory of causality has the following consequences. First, causal relation operates between the ideas of substances or their modes. Second, the "power" constitutes the ground of causality. Third, causality is known empirically through our experience or observation of change and succession. But all these interpretations do not have any implication in favour of the positive assertion that the causal relation is a necessary relation between cause and effect. According to Locke, causality is obviously necessary to explain the changes in the phenomena around us. But he never suggests that this causality is a necessary relation. What he suggests is that we derive the idea of causality on the basis of observation of the constant regularities in cause and effect in the succession of events. If so, the implication of this view is that causality is not a necessary connection but only a contingent one. Then the statement "The like changes will happen in the same thing in future by the operation of the same agent and in the same way" is not acceptable because the statement in question is, in fact, universal and necessary, and this character of universality and necessity can not be explained from his own empiricistic standpoint. This is so because our observation can not provide us with any logical ground on the basis of which we can prove convincingly that the same effect will be produced always by the same cause. This results in inconsistencies in Locke's interpretation of causal relation, and we find him taking the help of the Divine Will. According to him, the regularities which we find in the external world have been imposed by the Divine Will. So, the Divine Will maintains the universality and necessity of the causal relation among the phenomena, But this contention seems to be entirely whimsical as well as dogmatic because such an assumption is never valid from the empiricistic standpoint in so far as the Divine

Will falls beyond the limit of our observation.

In our foregoing discussion, we have seen that Locke's concept of causality is based on the presupposition of the notion of uniformity in the causal relation, i.e., the notion which is otherwise described as the universality and necessity in the causal relation. This is evident when Locke says by observing the changes in the phenomena that like changes will happen in the same thing in future by the operation of the same agent and in the same way. But two things are to be noticed in this connection. In the first place, Locke's empiricistic commitment does not allow him to accept the validity of the universality and necessity of the causal relation except the "constant regularity". In the second place, he himself has kept silent throughout his discussion on the problem of universal and necessary connection that causality is said to involve. If so, the inevitable outcome of this Lockean position is the following. The so-called sciences claim to provide us with universal and necessary knowledge on the basis of the causality. If causality is a mere relation of regularity, then scientific knowledge would be only probable knowledge; we may think that heat may not expand body in future and it will not involve any contradiction. But Hume does not want to deny the necessary connection in the concept of causality. What is to be noted here is that Hume has tried to put forward the view that this necessary relation is never an objective relation operating independently in the external phenomena but only subjective or psychological one due to the perceiving mind. According to him, we encounter only the changes in the phenomena and not any necessary causal connection which is nothing but an imaginary construction by the human mind. Hume's theory of causality is found mainly in the *Treatise*, and is restated in the first *Enquiry*.

Hume's exposition of the concept of causality as developed in these writings has the following three important factors. They are contiguity, priority and necessitation, First, the idea of causation stands for the relation between two events, viz, cause and effect. This has the implication that the two events called cause and effect are always contiguous in this sort of relation. Hume says, "I find in

first place, that whatever objects are considered as causes or effects, are contiguous; and that nothing can operate in a time or place, which is ever so little removed from those of its existence. Though distant objects may sometimes seem productive of each other, they are commonly found upon examination to be link'd by a chain of causes, which are contiguous among themselves, to exist...we may therefore consider the relation of contiguity as essential to that of causation".<sup>4</sup> Second, there is another essential factor of causation, viz., priority. This feature exhibits that the cause is always prior to the effect in time. This factor is also called by him "precedence". Hume's reason for giving an importance to this factor is that in experience we always find that cause precedes its effect, and after the operation of a particular cause a particular effect follows. Thus the notion of causation involves the succession of two events in time, and we cannot define cause and effect without the succession of the two events in time. "There is a usage of the word 'cause' in English in which we suppose a cause to be an event which produces another event later in time but contiguous with the first. Thus, we may say that the lighting of a match on a certain occasion was the cause of an explosion"<sup>5</sup>. Now Hume's theory of causation in this respect is certainly something new and different from those of Aristotle and Bacon. We do not find any such exposition in Aristotle's theory, while Bacon has interpreted his "Form" in such a way that it is only "contemporaneous" to its effect. But Hume's cause is regarded as the "antecedent cause" in order to differentiate him from both Aristotle and Bacon in this context. Third, the concept of causation involves the idea of necessitation. It is this idea of necessary or universal relation which is the most vital problem raised by Hume about the causal relation. According to Hume, contiguity and priority constitute the essential factors of the concept of causality but cannot exhaust all the aspects of causality. The reason is that an event may be contiguous and prior to another event but the former cannot be regarded as the cause of the latter, for example, the relation between day and night. So there must be a necessary connection between the events which are to be regarded as cause and effect.

---

4. Hume : *A Treatise of Human Nature*, p.75.

5. Kneale : *Probability and Induction*, p.53

According to this concept, the relation of a particular cause to a particular effect is necessary one without exception in the past, present and future. When we say that B follows from A, we accept A as the cause of B, i.e., A as necessary for the existence of B. But Hume argues that this necessary relation is not based on any logical ground, and so it can not be proved by an appeal to logic alone. According to him, the ground of our belief of this necessary connection is the frequent observation of the similar event. He says, "For after a frequent repetition, I find, that upon the appearance of one of the objects, the mind is determin'd by custom to consider its usual attendant, and to consider it in a stronger light upon account of its relation to the first object. It is this impression, then, or determination, which affords me the idea of necessity."<sup>6</sup> Hence the so called necessary connection is not given to the senses. After observing the repeated instances, our mind tends by the habit of custom to expect or think of an inseparable relation between two events. The abstractionists argue that the necessity in causality can be had by abstraction from particular instances. But Hume denies it because we can never encounter any such relation in the events. So we cannot say that the relation of necessity is a general idea which is obtainable through abstraction. Again, Hume tries to refute the rationalist's contention that when we speak of a necessary connection between two events, this connection depends upon an efficacy or power with which any of them is endowed because he claims that this efficacy or power is not something which is known through observation and is, therefore, unintelligible.

Consequently, Hume goes against the causal inferences or causal reasonings which are based on the uniformity of the causal relations. It is a fact that in our causal inference or reasoning we go beyond the limit of our experience on the ground that the causal relation operates uniformly in the phenomena in nature. But Hume holds that there is no logical certainty in such a causal inference or reasoning for the obvious reason that a causal relation does not involve any necessary connection but gives only a probable reasoning. This is so because the basis of such causal

6. Hume : *A Treatise of Human Nature*, p.156.

inference is our experience or observation of "constant conjunction" of two events. We bear in mind the frequent instances of events and notice that there is a regularity, contiguity and succession in every observed instance. In our previous experience we have noticed this "constant conjunction" that an event 'flame' was followed by the sensation of 'heat', and united these two ideas in imagination by the principle of association of ideas. When one is given, we infer by the habit or custom the existence of the other from the past memory or experience. Thus our causal inferences are union of our ideas, i.e., the inferential process which is determined and guided by the principle of association of ideas rather than by reason itself. In other words, we are guided by the habit or custom and impose the qualities of the past on the future. Thus the possibility of inductive reasoning is only due to the habit or custom that originates in observation. So Hume concludes that it is a habit of mind to anticipate that the same effect will be followed by the same cause; the necessary connection supposed to be in the causation is a feeling which is only psychological and nothing else. But this Humean position which is a logical consequence of his being a strict empiricist is not at all satisfactory. This can be illustrated by the reference to the fact of wave's striking a boat. When we say that a wave striking a boat causes it to move, we imply that there is a positive relation operating between the cause and the effect, i.e., between the wave's striking a boat and the movement of the boat. This relation is not a mere feeling which is derived solely from our observation of these instances. That a thing will get in the same way at different times implies that it follows from the nature of the thing and the situation. To deny this necessary connection in causality is to deny the causality altogether. In this case, it means that any effect can be produced by any cause but this is not true. Only a specific cause can produce a specific effect such that the relation in question is a necessary relation existing objectively in the external phenomena. It can not be denied that one particular standpoint may fail to help us to grasp the relation adequately but this should not be taken to be the reason for deciding or concluding that there is no such relation at all. Popper says, "At any rate, in the light of a conjecture we can not only explain cause and effect much better than Hume ever did, but we

can even say what the 'necessary causal link' consists of. Given some conjectured regularity and some initial conditions which permit us to deduce predictions from our conjecture, we can call the conditions the (conjectured) cause and the predicated event the (conjectured) effect. And the conjecture which links them by logical necessity is the long-sought - for (conjectural) necessary link between cause and effect."<sup>7</sup>

The concept of causality receives a new shape in the hand of John Stuart Mill because he has dealt with this problem completely differently from his predecessors. In this connection, the credit goes to him particularly due to his discussion of the methods which aim at the discovery of causal relation. Scientific investigation aims primarily at discovering the causal relationships among the natural phenomena. Mill claims that his five methods, viz, the method of agreement, the method of difference, the joint method of agreement and difference, the method of residues and the method of concomitant variation can help the scientists to discover and demonstrate the causal relations. However, Mill means by the causal relation the relation of invariability in which cause and effect are related invariably. On this interpretation, the cause is said to be the invariable antecedent to the effect, while the effect is called the invariable consequent to the cause. Mill defines the antecedent cause thus, "The cause, then, philosophically speaking, is the sum total of the conditions positive and negative taken together; the whole of the contingencies of every description, which being realised, the consequent invariably follows."<sup>8</sup> The antecedent cause is defined as certain combination of some other conditions or facts, viz, positive conditions or facts and negative conditions or facts. The role of these two conditions is to help jointly the cause for its operation to produce the effect. In other words, when these two sorts of conditions are realized or satisfied, then the consequent invariably follows. For example, taking poison causes one's death. Here the cause is composed of such positive conditions as poison, bodily constitution, etc. While the negative conditions are the absence of preventive drugs, etc. The cause is thus the sum total

---

7. Proper : *Objective Knowledge*, p.91.

8. Mill : *System of Logic*, p. 217.



of positive and negative conditions, which being actualised, the effect invariably follows. Mill says," In other words, every fact or phenomenon which has a beginning invariably arises when some certain combination of positive facts exists, provided certain other positive facts do not exist."<sup>9</sup> But the definition of cause as the invariable antecedent to the effect appears to be confusing because there are cases where it becomes very hard on our part to find out the invariable antecedent cause. The obvious case known to us is that of the relation between day and night. If we follow Mill's interpretation, we have to say that day is the cause of night or night is the cause of day. But it is not acceptable because neither of them is the cause of the other. We know that both day and night are the effects of the cause which is the movement of the earth. Here Mill's suggestion is that invariable sequence does not mean what ordinarily passes for causation, unless the invariable sequence is unconditional. Thus unconditionality is equally an important factor besides the condition of invariability. In the words of Mill, "We may define, therefore, the cause of a phenomenon to be the antecedent, or the concurrence of antecedents, on which it is invariably and unconditionally consequent or if we adopt the convenient modification of the meaning of the word cause which confines it to the assemblage of positive conditions without the negative, then instead of "unconditionally", we must say, "subject to no other than negative conditions".<sup>10</sup>

According to Mill, every use of the word "cause" is a universal law; i.e., a doctrine that cause and effect are uniformly connected. We admit that a particular circumstance causes a particular effect only if we agree that any other circumstance of that type will— if the attendant circumstances are sufficiently similar—cause another effect of the same kind as the first. In other words, similar causes produce similar effects. The very meaning of the word "cause" as used today is that every occurrence of a cause producing an effect is the example of a general causal law or universal causal law that such circumstances are always accompanied by such

---

9. Mill : *System of Logic*, p. 216.

10. Ibid. p. 222.

phenomena. Since a general causal law of this sort is implied by every assertion that a particular circumstance is the cause of a particular phenomenon, there is an element of generality in every such assertion. Therefore, a causal law is an assertion that such circumstance is invariably attended by such and such a phenomenon, no matter when or where it occurs. Now the problem is how we come to know such general or universal causal laws. Since the causal relation is not a purely logical or deductive relationship, it can not be discovered by any apriori reasoning. On the other hand, these laws can be discovered only empirically, i.e. only by an appeal to our experience. We observe several instances of certain kind of circumstance (C), and every instance that we observe is accompanied by an instance of certain kind of phenomena (P). On the basis of these observations, we come to the conclusion that "some cases of C are cases of P. But how can we get the general or universal proposition that "all cases of C are cases of P" or that "C causes P"? Mill holds that the method of arriving at this general or universal proposition that "all cases of C are cases of P" or that "C causes P" from the particular facts of experience is called inductive generalization. All these methods work by eliminating rivals candidates for the role of cause. So Mill's Methods of induction are also called the "Eliminative Methods of Induction". Mackie says, "The general nature of these methods may be illustrated by examples of the two simplest methods, those of agreement and of difference".<sup>11</sup> The method of agreement runs thus: ' If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstance in which alone all the instances agree is the cause (or effect) of the given phenomenon'. Here we concentrate our attention only on the 'agreeing' point in which the antecedent A exists and B follows. A is the common feature, and we can, therefore, conclude that A is the cause of B. On the other hand, the method of difference is thus stated: ' If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common

---

11. Mackie : *The Cement of the Universe*, p.297.

save one, that one occurring in the former; the circumstance in which alone the two instances differ, is the effect or the cause, or an indispensable part of the cause of the phenomenon'. The method of difference picks out as the cause the one respect in which a case where the effect occurs differs from an otherwise exactly similar case where the effect does not occur. Here we observe that A is absent and B does not follow though all other conditions remain the same in both the cases. In this way we depend on the inductive generalization to find out the causal law. We first become familiar with many partial uniformities of sequence or many cases of causation. These are causal laws of inferior generality. From these several particular facts of experience that a certain kind of circumstance A is accompanied by a certain kind of phenomenon B, we get the universal proposition "all cases of A are cases of B". So Mill holds that the belief in the universality in the causal relation is not instinctive but an example of inductive generalisation.

Mill argues that the doctrine of universal causation is grounded in the principle of the uniformity of nature. This assumption is warranted if we look at the actual course of nature. We observe that there is an order and unity in nature, and proceed to construct on its basis that whatever is true in any case is true in all cases of the same nature. Thus the belief in the uniformity of nature is based on our experience. And this is the principle which is responsible for the uniformity or universality in the causal law. This universal causal law is our warranty for all our inductive inferences from the known to the unknown. So the uniformity in nature is the ultimate major premise which makes our induction possible. Now, the old problem arises here as to how Mill explains the concept of necessary connection in the causality. Certainly, he has no other alternative than to opt for the Humean tradition. Mill argues that the necessary relation in causality is supported by the uniformity in nature. The question is: What is the guarantee that nature behaves uniformly so that we can assert the universal causal law that such and such circumstance is invariably attended by such and such a 'phenomenon'? To this, Mill's answer is that the guarantee is rooted in our observation. If so, observation or experience, as we have noted earlier, cannot

give us any necessary connection either in the course of behaviour in nature or in the case of causal relation. In this sense, we are, then, cutting out the idea of necessary connection and trying to content ourselves with mere uniform succession, that is, we are attaching ourselves to an empiricism like that of Hume. Ducasse says, "It succeeds only in obscuring the issues, without solving any of the difficulties".<sup>12</sup> Being an empiricist, he is not interested in the search of necessary relation in the causality. To him, the causal principle is an empirical generalisation from experience and, therefore, it is a synthetic a posteriori truth. In so far as the experimental methods are concerned, Mill is interested only in discovering this causality in the realm of human experience. But we see here that his methods have not always been able to discover the real cause. It is an undeniable fact that competent scientists have been working for decades to discover the cause of cancer but the methods used by Bacon and Mill are not at all able to find out the cause so far.

### 3.2. The Later Empiricist Approach

In so far as the concept of causality is concerned, we find that the Humean tradition has more or less been carried on by the latter empiricists like Bertrand Russell, Samuel Alexander, Arthur Pap and Alfred Julius Ayer. However, their modes of treatment of the problem of causality are, no doubt, different. This is because all of them have looked at the problem from their respective originalities. But what is worthnoticing amidst these differences is that they have the common consent to the central thesis of empiricism that the concept of causality is a de facto regularity. Consequently, their attitude always goes towards the denial of the concept of causality in the ontological sense. They have abandoned it because observation reveals only the uniformity of sequence and nothing else. Secondly, it is equally an undeniable fact that the writings of these philosophers have been influenced all along by some modern sciences specially by physics and mathematics. Obviously, their solution

---

12. Ducasse : *Causation and the Types of Necessity*, p.26.

to the causal problem has a bearing upon sciences as well. Russell is of the opinion that the concept of causality which is commonly held by philosophers is false. This concept does not have any application in science. In this connection, Russell has clearly favoured the commonsense view of causality. The common people believe that causality means a general proposition which helps to infer the unseen from the seen or known. The general proposition "All thunder is preceded by lightning" is a causal law. It is because of this causal law that one who hears the sound of thunder but did not see lightning can infer that there was a flash. Russell says, "By "a causal law" I mean any general proposition in virtue of which it is possible to infer the existence of one thing or event from the existence of another or of a number of others. If you hear thunder without having seen lightning, you infer that there nevertheless was a flash, because of the general proposition, " All thunder is preceded by lightning." This general or universal proposition, i.e., causal law is composed of two parts, viz, antecedent and consequent. The antecedent and consequent themselves are particular events like "this thunder", "that lightning", and so on. In the causal concept, these two particular events have the relation of accompaniment. Russell has interpreted it in terms of the relation of constancy. So, when we say that thunder always accompanies lightning, we mean to say that these particular events themselves are not constant but the relation between them is. Again this relation is temporal, i.e., in the form of succession between the antecedent and the consequent. In this relation the antecedent is given first or earlier while the consequent is inferred later on the basis of the antecedent. But it does not mean that Russell accepts the so-called necessary connection in the causality. Though the causal law is general or universal, yet it is not so in the strict sense of the term "universal". According to him, the strict universal causal law is an ideal; it may be true but there is no available evidence by means of which we may be sure of it. But we accept the causal law because we believe it, and our belief in such causation is "The animal belief". The lower animals like dogs, horses, etc

have this belief. These animals experience the uniformity of sequence, and some sort of expectation grows in them. Later on, when the animal observes one event of the sequence, it expects the other. This is a mere psychological expectation in the Humean sense. Similarly, Russell holds that we have the animal belief in the causation. We repeatedly observe the uniformities of sequence, for example, we experience that after lightning thunder comes, and the experience of this uniformity of cause and effect leads us to expect that this will follow on future occasions, too. Thus causation is not a connection between events; it is only the uniformity of sequence which is observed in many cases. Since this relation is available only through the observational evidences, there seems to be no exhaustive evidences by virtue of which the relation can be proved to be certain. Hence, this relation can fail to hold in future under the newly acquired set of evidences. But Russell here argues that in such a case we will try to find out the more constant relation under which the events fall. But this assumption, according to him, is probable and yet it is sufficient for our rational expectation and practical guidance. So causality is a working hypothesis which may be ruled out by subsequent observation and experiences.

The scientists, Russell holds, use such hypothesis which are based on observation. A scientific method tries to establish hypothesis by collecting relevant data related to the case concerned, and it is confirmed or disconfirmed by subsequent observation. In this sense, a hypothesis is a tentative truth which has the possibility to be overthrown in future. If so, the scientific laws are causal laws that are merely hypothesis. This is very obvious in the case of atom. The scientists have claimed that they have been able to provide the explanation of the behaviour of atom in accordance with the principle of causality but they are in a fix the moment they try to penetrate into the problem more deeply. In these cases, the scientists have tried at their best level to find out the causal relation but in vain. None of them is sure of the relation so far discovered. They remain satisfied with merely stating what is going on there. This provides no reasonable ground for our belief that whatever happens in nature happens according to the law of causality. So the simple scientific law which

we hold as causal law is not necessarily based on solid foundation, and probably the true cause is yet to be discovered. But science accepts it so far as it is only a working hypothesis. When a scientist only observes uniformities of sequence in particular cases and concludes that all As. are Bs; he assumes that the next case of A will be the case of B. But this assumption is only probable as already shown above. Yet it can not be denied here that a scientist is able to proceed few steps ahead in his search on the basis of this assumption. But he should remember that the causal law which he has so far discovered is only approximate and not absolute. Russell's observation appears to be improper in this context because the scientists are not thinking along this Russellian track. They point out that this sort of uncertainty is, no doubt, faced in quantum physics, but we face that problem upto a certain stage. After a certain stage the atomic jump is not determinable because it is then uncertain. In this connection, Planck and Einstein hold that if we broaden our experimental range, we would be able to find out the operation of causal laws there. Planck says, "...the non-fulfillment of the statistical rule in particular cases is not therefore due to the fact that the law of causality is not fulfilled, but rather to the fact that our observations are not sufficiently delicate and accurate to put the law of causality to a direct test in each case. If it were possible for us to follow the movement of each individual molecule in this very intricate labyrinth of processes, then we should find in each case an exact fulfillment of dynamical laws."<sup>2</sup> Thus Russell has not been able to evaluate properly the causal activities in sciences. Harris argues that the relation between cause and effect is not equivalent with the mere succession of sequence in time. We should not forget that the temporal succession is serial order where the order of change is determined by one another. According to Harris, "What constitutes temporal succession is a serial order, and while the changes themselves are constituted by the qualitative development of the material in which they occur, their temporal order is determined by the application of a metric to the process so as to relate events to one another as a continuous order. Such correlation of changes with

---

2. Planck : *Where is Science Going ?*, p.145.

a metrical scale is possible only if there is a rule of succession linking the phase of the process and determining their order. This is just another aspect of the heterogeneity of the continuum and is the source of the cause-effect relationship."<sup>3</sup> Thus Harris supports the determinacy in the concept of causality. He says, "In the course of the process of change these relations do not change and are, in fact, irreversible, not because the temporal reality is static—quite the reverse, because the metric is a fixed scale, within which the divisions and demarcations stand in mutual relations that are of necessity unalterable."<sup>4</sup> So it is obvious that Russell's view of mere succession of event is not satisfactory in so far as the modern science is concerned. If we accept this view, then all the events become isolated from one another. But science attempts at providing a comprehensive and systematic knowledge of the universe and tries to establish the causal laws from this standpoint, while the observation of atomic events in mere succession can not help us to discover the laws here. Boodin does not accept Russell's position. According to him, it is no doubt that there are complicated facts in nature and it is a problem which prevents us from discovering the continuous process in the natural environment. Yet he admits that the natural environment is not composed of isolated facts. In nature there is a determinate factor which determines the course of nature. Both animate and inanimate objects act and react in a definite manner according to their nature and properties and as such there is no randomness of events. They act and react in precise way to the properties and to the temporal and spatial relations within specific contexts. Therefore, the Russellian approach towards the problem of the concept of causality fails to overcome the gap between the epistemic aspect and the logical aspect of the relation. In so far as our perceiving capacity is concerned, we, as Russell seems to contend, only encounter the uniformities of sequence and nothing else. So the necessary connection involved in the causation goes outside the scope of observation and, consequently, remains unexplained. On Russell's interpretation, we do not have affirmative attitude in this regard. Alexander belongs to the tradition of

---

3. Harris : *Foundations of Metaphysics in Science*, p p.472-473.

4. Ibid. p. 476.



English philosophers and undertakes the attempt to overcome the gap between the epistemic aspect and the logical aspect of the concept of causality, According to him, the concept of causation as analysed by the common people, the scientists and the philosophers as well fails to exhibit the true nature of the concept in question. The common sense view is in favour of regarding the cause as a distinct substance which possesses in it the 'energy' or 'power' to produce an effect. The empiricist philosophers in general hold that what we perceive in our experience is only the succession of events in time and nothing else. It is because of this epistemic standpoint that these philosophers have been unable to find out the logical or necessary relation supposed to be contained in the causation. The logical Idealists have identified the causal relation with the logical implication that holds between the logical ground (premise) and its consequent (conclusion). Consequently, these philosophers have usually built a system of ground and consequent like the process of geometry where the real causal ground and the effect together with their actual relation fall outside this system itself. Science regards both the cause and the effect as existent events; it tries to find out in so many existing events a precise causal factor for its effect, e.g., 'the event B follows after the event A', and claims its universal applicability to future case also. But Alexander in his treatment of the concept of causation goes against the so-called views of it. According to Alexander, the common-sense view that a thing or a substance is the cause in so far as it has the 'power' to produce an effect is not satisfactory. The reason is that a thing by itself alone is a static concept and cannot be the cause until and unless it comes to be related to other events in the relevant contexts. This static concept of causality in some other form reappears in the empiricist philosopher's treatment of the notion as a mere succession of events in time. Alexander argues that this view fails to be adequate because the events are regarded here as mere isolated occurrences and not as a continuous process. If so, the cause in this discontinuous sense can have no reference from present to future, and, hence, there seems to be no real sense in asserting that the future is thereby determined. The logical consequence of this position is that it destroys the important mark of causality that the cause is essentially prior to the

effect. This is applicable equally to the case of science where the causal relation is limited only to the actual correlations of isolated existents.

Alexander holds that the so-called views of causality have rendered it static concept and not dynamic, while he says that this dynamic aspect constitutes the very heart of causality. According to him, cause and effect are two different motions in a state of continuity ; the cause on this view is the motion which is continued into the motion of effect. The concept of motion in Alexander's treatment of causality is extremely and basically vital. The ultimate reality or cause from which all things are engendered is Pure Motion or space-time. This is the ultimate cosmic reality which is otherwise called the fundamental dynamic principle. According to him, we should not speak of space and time as two distinct and separate realities as Newton thought. If by space we mean co-existence of several points, the points then must be arranged in successive order, i.e., one after another. It is, therefore, evident that the idea of space includes that of succession or time, that is, the idea which means succession among events . If one event succeeds another event, then both of them must be existent in space, and the idea of time, therefore, includes the idea of space. All events are space-events, and all space-points are even-points. Therefore, Alexander holds that we should speak of 'space-time', without speaking of space and time as separate realities. Now, the motion of space is, therefore, made up of points successively occupied by instants of time. These point-instants are called events of which motions are made up. This motion is something which is continuous from past to future, and, hence, the events which are the ultimate constituents of the world have their location not only in space but also in past and future. Alexander says that what we call a substance or matter is composed of motion. Therefore, when it is said that causality is a relation between substances, we mean to say thereby that both the cause and the effect are motions, the former motion as the cause is continued into the latter motion which is the effect. Alexander says, "But a substance is a system of motions and whether the cause is a substance or a motion is all one. A cause is the motion of a substance, or a substance in respect of its motion. Thus the cause of the

breaking of the window-pane is the motion of the stone or the stone in motion".<sup>5</sup> He argues that the succession of events is not an essential feature of causation because it does not involve the change or motion in the causation. So the cause and the effect both are motions in the system of continuous motion of space-time. He says, "Causality is thus the spatio-temporal continuity of one substance with another; and the cause is the motion which precedes that into which, let us say, it passes or is transformed".<sup>6</sup> This conception of causality as thus propounded by Alexander has the implications of his fundamental hypothesis that space-time is a continuous system in which every event is related to one which precedes it and to one which follows.

While explaining the notion of causality, Alexander has classified it into two kinds, viz, transeunt causality and immanent causality. In the case of transeunt causality, one motion or a set of motions turns into a different motion, for example, 'fire burns the wax'. Here the 'fire' and the 'melting of the wax' are two different motions. This shows that when the cause and the effect are two completely different substances, the causal relation is called transeunt. On the other hand, when either the effect is produced from the same substance or the relation of cause holds between the parts of an organic system, it is called immanent causality, for example, curd is produced from milk. Thus in the case of an immanent causality, both the cause and the effect are on the same direction of continuity, while in the case of transeunt causality the cause and the effect are in different directions of continuity. Johnson says, "Here then the cause occurrence and effect occurrence are referred to different continuants, whereas in immanent causality cause occurrence and effect occurrence are attributed to the same continuant. This illustration serves further to indicate what may be assumed to be universally applicable, that any concretely described causal process must be analysed into a conjunction of transeunt and immanent causality; and neither types of causality are to be found actually separate".<sup>7</sup> Alexander thinks that there is no self-contained substance in the universe; each and every substance is related to some

---

5. Alexander : *Space, Time, and Deity*, p.280.

6. Ibid. p. 281.

7. Johnson : *Logic*, pp. 128-129.

other substance. If so, the distinction which is drawn between the two sorts of causality is only relative; the universe itself is the only immanent cause. This concept of causality as the spatio-temporal continuity of one substance with another makes itself a dynamic concept, the one that has a reference from present to future, and hence, involves the reason that the future is thereby determined. According to Alexander, everything in this world-process has emerged from the space-time matrix. He posits space-time as the base of the pyramid of emergent evolution from which higher and higher levels, matter, life, mind and deity emerge (but Alexander thinks that deity will emerge as the highest category out of the mind). In other words, nature forms a pyramid where in each case the higher presupposes the lower, and those which occur at higher levels are characterised by the general features at the base of the pyramid. "Two main features have been noted so far. The first is that every thing in the world is made up of motions, more or less complex; the second is that a particular combination of motions has qualities which are inseparable from it. The former was worked out by Alexander in terms of point-instants and the categories which make up the space-time continuum; the latter, in terms of the theory of emergent characters".<sup>8</sup>

The consequence of Alexander's notion of causality is that it leads to the view of emergent evolution, for the qualities when they are produced by the cause are only emergent qualities. The mechanists take evolution as a continuous and unbroken process of change in which nothing completely new appears, but every level is a bare repetition of the preceding level in a more complex form. In the evolution of life from matter, life is only a complex form of matter and as such it is not a new creation. But Alexander holds that life is a new phenomenon that did not pre-exist in the material cause. We should be careful here about the distinction between 'resultant quality' and 'emergent quality'. The resultant quality is only the repetition of their antecedents and as such are deducible from their causes. For example, in the case "Oxygen and hydrogen produce water", the weight of water is equivalent

---

8. Magill : *Masterpieces of World Philosophy*, p. 828.

to and is a repetition of the weight of the elements combined. On the other hand, the emergent quality is a novel one which is not deducible from their causes. Thus, life which comes from the non-living matter is material, but it is a matter with new quality of 'vitality'. So when a cause produces an effect, something 'new' is being continuously evolved or emerged in this causal process. This sort of interpretation of the causal relation leads Alexander to the doctrine of teleological evolution. He admits that 'Nisus' is the power or agency that directs or pushes the evolution towards the deity, and though deity does not now exist, yet as the next order to evolution it is experienced as future. Thus in Alexander's system, past and future are just as real as the present. The reason, as we already mentioned, is that cause and effect are two different moments in the continuous system of space-time. This shows that causality is not the result of our psychological expectation as Hume and his followers asserted. But Alexander's standpoint does not seem to be satisfactory in so far as his conception of deity is concerned. He has said that deity will emerge as the highest category out of mind and there is a nisus or impulse towards this. But if space-time matrix, according to Alexander, is the cause of everything, then it does not justify the presence of the nisus. Besides, the concept of deity is claimed here to play almost all the same role as Aristotle's idea of God in the sense of the 'teleos' of this dynamic world. Consequently, everything that happens in nature is completely disposed so as to reach the goal of deity but that is not so settled by the metaphysical necessity. The causal process is certainly determined by this sort of goal because evolution, according to this standpoint, is regarded as a process of achieving new values whose nature is unpredictable by us and hence it is a matter of possibility. Again, it is objected that mere spatio-temporal continuity does not amount to causation, for this conception only expresses a half-truth of it. In making a comment on Alexander's view of causality, B.K. Bhattacharya says, "For both temporal and spatial continuity can be determined only through the help of regular sequence and this regularity need not be spaced out in time but may be observed by different persons in different places at the same time. Hence regularity of sequence is a test for causation not with reference to its necessity or invariability but with reference to its character of

causation as distinct from a mere sequence that is not continuous and a mere co-existence that is not continuous. Contiguity, both spatial and temporal, can be ascertained from a single observation, but not so continuity which is, strictly speaking, beyond the scope of observation and even of experiment. We can determine it only with more or less probability and this is the real reason why even regular sequence cannot establish causal connection with absolute certainty. It may be objected that under the circumstances we should not speak of continuity, but in that case we should not speak of causality either".<sup>9</sup> Pap has implicitly tried to provide an affirmative answer to the aspect of the necessary connection in the concept of causality. In the foregoing discussion, we have seen that Hume, Mill and Russell have arrived at the conclusion that causation is nothing but a regular sequence of events. So it leads to the probabilistic view of causality, that is, the view that the relation between cause and effect is merely a probabilistic correlation. Pap accepts this regularity theory of causation not in the sense of probabilistic correlation between cause and effect but in some other stronger sense.

What is the regularity of the theory of causation in this stronger sense? The reply is that this stronger sense does not imply that the relation in causality is a logically necessary relation. The causal relation is established on the basis of evidences which are empirical in nature. Whatever may be the range of such empirical evidences, it can not help us to establish the so-called necessary relation between cause and effect. Again, the relation in causation which we thus establish is also refutable on the basis of subsequent perceptual evidences because the future is unseen and unpredictable. Hence the negation is possible, and this negation in respect of any causal judgement is conceivable without any contradiction. Besides, one may argue that if by the word "cause" we mean "power", then this power is such that it necessarily produces its effect. But the ascription of the power to the concept of cause does not help us to be certain of the necessary relation in

---

9. Bhattacharyya : *Causality in Science and Philosophy*. pp.170-171

causation. This is because the very problem of unpredictability regarding the future also arises here. We do not know future and there the so-called power may lose its capability. It may be said that arsenic may lose its power of poisoning in future. This shows that we have no way in favour of demonstrating positively the necessary connection in the causality. Rather the only alternative before us is to describe the causality as the regular succession of two events, i.e., the former event is followed regularly by the latter one in such a relation. And here in lies the important difference between Pap and his predecessors. Pap has tried to interpret this regular succession theory differently from that of the previous philosophers. What is lacking in the previous account of the regularity theory? To interpret this, Pap has introduced a distinction between two sorts of propositions: (1) 'A caused B' and (2) 'A preceded B'. Pap argues that the relation in the proposition 'A caused B' is implicitly compulsory. We can discover with our rudimentary knowledge of causation that the antecedent 'A' has some sort of 'power' which makes B happen as its consequent, while in the second case of 'A preceded B', the relation is not compulsory but one of succession. 'A' is here only the temporal antecedent but not a causal one of the event 'B'. In this case, 'A' does not have any power to make 'B' happen. It is only for this reason that any temporal antecedent to the effect can not be regarded as the cause. If we do so, then there would be a fallacy called "Post hoc ergo propter hoc". The two events 'A' and 'B' in the proposition 'A preceded B' are related only in terms of temporal relation of succession, while the two events 'A' and 'B' in the proposition 'A caused B' are not only related in respect of temporal succession but also in respect of causal connection. So the proposition 'A caused B' is never entailed by the proposition 'A preceded B', but the latter is always entailed by the former. So Pap concludes that if the regular succession theory of causation means 'A preceded B', then it fails to capture the real character of the causality. He holds that we should be always very cautious about the selection of antecedent cause. The fallacy "post hoc ergo propter hoc" warns us for this purpose; we should, therefore, not forget that any temporal antecedent can not be considered as the cause of the effect concerned. Now, Pap thinks that the proposition 'A caused B' holds the relation stronger than

that which the proposition 'A preceded B' holds. According to him, it is entirely due to the antecedent cause 'A' which occurred in the first case. The cause 'A' by itself is not able to function its role properly in the causal relation. It can do this if it is in conjunction with some other condition 'C'. The addition of the condition 'C' to the cause 'A' makes 'A' a necessary condition for the event 'B'. Pap calls such a condition 'A' 'conditionally necessary condition'. This sort of condition called 'C' is obviously the fact when we analyse a particular causal statement like "The striking of a match causes a flame". The striking of a match by itself can not cause a flame but it can do so only by its dependence on or conjunction with some other conditions like 'the presence of enough oxygen', "the dryness of the match", etc. These conditions jointly constitute the condition 'C'. According to Pap, it is conclusive that 'A causes B' or 'the same cause produces the same effect' when the other condition 'C' is fulfilled. Ordinarily we do not engage ourselves into the analysis of such conditions; we simply say that the same kind of effect can be produced by the striking of a match knowing implicitly that the other condition 'C' is already fulfilled in this context. So the causal relation between 'A' and 'B' in the proposition 'A caused B' is not logically necessary, but only compulsory due to some efficiency in the antecedent cause 'A'. Since the antecedent cause 'A' depends on the fulfilment of certain other condition 'C', 'A' as the 'cause' of a particular event is necessary but not sufficient condition for the effect. Thus the causal relation is not like the material implication of symbolic logic ; it is rather a weaker connection than analytic connection. Hence the fact is that 'that similar cause produces the similar effect' may be justified but does not follow analytically. Because we can not find out the logical certainty of the causal relation on reflection upon the words used in the causal relation. Pap holds that the previous regularity theory of causation has failed to take into consideration this account of the causal antecedent:

Now, Pap argues for the dispositional factor in causal statement in order to prove that the same cause would produce the same effect in future, too. The modern scientists and positivistically inclined thinkers such as Mach and Hertz have



supported this view. Instead of using the "occult power" or 'force' in the notion of cause; they have used the word 'disposition'. The disposition, according to them, is a quality which causes certain type of effect not only at present but also in future as well under the same circumstances. In other words, "disposition' is the inherent capacity by which a substance acts in the same manner under the same circumstances. 'Sugar is soluble in water' means that sugar in contact with water has this power or capacity to behave in a particular manner. This sugar is soluble in future also if it is in contact with water. But if at the time variable the circumstances do not remain unchanged, then a given thing may have a certain disposition at one time but not at another. This shows that we are justified in believing the dispositional interpretation of the causal proposition. Again, in subsuming an observed regularity under a dispositional concept, one anticipates an explanation in terms of the intrinsic, structural microproperties of things involved. When we say that 'fire burns', we anticipate that 'fire' is characterised by some microstructural property by which it produces its effect. On the basis of such dispositional statement, we can have a transition from the empirical science to the unifying theoretical science; it is possible for us to predict at least theoretically about the states and processes of the physical objects. This prediction leads to a causal determinism. He says, "The assumption of permanent objects and unobserved physical processes is forced upon us by the principle of causality, by the desire to account for our sense-impressions in terms of fairly simple laws".<sup>10</sup> The causal determinism does not require us to have the sense-impression of the entire process at work. Pap admits the close logical connection between physical realism and causal determinism. The principle of causality is working not only in the physical sciences but also in the social sciences. Social sciences can not venture to predict any law which is as certain as the laws in physical sciences. The reason is that the subject matter is here human behaviour and 'free will', and all these are the results of our conscious behaviour. But Pap does not allow any incompatibility between 'free will' and 'determinism'. The alleged incompatibility arises from our superficial sense of the

---

10. Pap : *An Introduction to the Philosophy of Science*, p. 325.

word 'free will' or 'free action'. It is said that a free action is one which the agent desires and prefers to do. But desiring is distinguished from deciding. Deciding does not mean just the desire to do, for looking at the consequences of a certain desire we decide not to do. Thus, a free action is defined as an action which the agent decides to perform. Pap argues that 'determination' and 'free will' fall within this same boundary. Now physicist would allow that, given all the physical forces determining a particle's motion and given the particle's initial state, it could have moved differently from the way it moved. Similarly, given all the causal antecedents, no body could have desired or decided differently. Pap says, "Even if quantum jumps occur in the brain when a human being consciously reacts to the environment in a certain way, his reaction might still fall under a "deterministic molar law" of the form. "Whenever a human with (acquired or inherited) disposition  $D_1, D_2, \dots$ , is exposed to an environment of kind E, then he reacts by doing A".<sup>11</sup> So the human behaviour is guided by the principle of causality.

Pap has mentioned that the modern scientific attitude goes sometimes in favour of the theory of relativity. This theory is a challenge against the validity of the causal determinism. The contention is that it is not possible either practically or theoretically to predict about the nature and activity of the individual electrons. So, the principle 'Every event has a cause' is not working here. Pap holds that this objection is not insurmountable, for we have to find out the sufficient conditions for the effect. In this connection, his suggestion is that when we establish a causal generalization, this should be qualified by this escape clause 'provided the same relevant circumstances are present'. It is certainly the fact that a cause produces its effect if the relevant situation remains unchanged. It is not logically possible to avoid the notion that every event has a cause. The scientists take the help of the causal principle in order to find out the cause of a particular effect. Pap says, "The principle of causality, therefore, is not analytic, nor is it an inductive generalization that could be refuted by contrary instances. It is best described as a guiding principle of

---

11. Pap : *An Introduction to the Philosophy of Science*, p.333.

causal inquiry that owes its success to a contingent feature of the universe. It "guides" the scientist in his search for a difference in antecedent conditions to account for the fact that apparently similar antecedents were followed by dissimilar effects, whether in this conception it can be claimed to be a true, or at least a well-confirmed proposition, or should be accorded the status of a "rule of procedure" that cannot properly be called true or probably true, is really a matter of taste since the distinction between a proposition and a rule of procedure becomes somewhat fuzzy as we ascend on the ladder of inductive generalization".<sup>12</sup> We may say that the causal law is a hypothesis but it differs from the hypothesis in the ordinary sense. Planck holds "But it is a fundamental hypothesis because it is the postulate which is necessary to give sense and meaning to the application of all hypotheses in scientific research. This is because any hypothesis which indicates a definite rule presupposes the validity of the principle of causation".<sup>13</sup>

Thus is evidently clear from the above discussion that Pap has tried his best to provide the certainty to the causal relation, and this attempt has been made from the scientific standpoint. But he fails to lead the position very far because of the limit of the standpoint which is empirical. The certainty for which he has pleaded is not a logical certainty between cause and effect; it is not demonstrable a priori or analytically. Ayer is in agreement with Hume and Russell in so far as the causal law is concerned. He holds that the place or the source of the so-called necessity is in our mental habit of association and equates causality with the regular sequence. This is very much evident when Ayer defines the term 'cause'. According to him, a cause always precedes its effect; it never succeeds its effect. It shows that Ayer has particularly pointed out the causal directions in clarifying the meaning of the word 'cause'. The reason for holding the above definition of cause is that the course of events takes place earlier and later; it is that where we can make more precise inferences from earlier event to later event but not conversely. Secondly, the causative verb always

---

12. Pap : *An Introduction to the Philosophy of Science*. p.311.

13. Planck : *Where is Science Going ?* p.153.

shows this sort of direction; it is always 'forward-looking'. In so far as the meaning of the causative verb is concerned, it has a reference to the future. Thirdly, the human activities also involve this sort of direction; these are equally 'forward moving'. Consequently, Ayer defines the concept of causality in terms of the direction of events. The direction of events is such that a cause always precedes its effect and the effect succeeds its cause. In defining causality, Ayer has been influenced by Hume. His interpretation of the antecedent cause makes us remind Mill's influence. Ayer like Mill has defined cause in terms of positive and negative conditions, and both of these conditions, according to him, are essential for the production of the effect. But the question is how these conditions can be defined. There is some method for this, "For example, it is usually possible to distinguish between what Prof. Price has called standing and differential conditions - that is to say, conditions which are relatively stable and conditions which come in changes and it is then the differential conditions that are singled out as causes. Thus, in the case of a forest fire, it is the spark that ignites the fire, and the wind that fans it, that are said to be the cause of conflagration, rather than the state of the climate or the composition of the world."<sup>14</sup> Now, Ayer holds that the relation between a cause and its effect is invariable in the sense that when the cause is present the effect will follow. When we say that 'A causes B', we mean thereby that either A is the sufficient condition for the happening of B or A is the necessary condition for this occurrence or A is both the necessary and the sufficient condition for B's happening. Ayer holds that the relation between cause and effect is not necessary and universal but only contingent. This is so because any one can deny the causal relation without self-contradiction. So the relation is not logical in character. Ayer speaks of the workability in practice in order to provide the justification for the causal law. If the causal law works successfully in practice, then we are justified in accepting such a law.

Ayer argues that we desire the idea of cause from experience as we have already mentioned above, and the repeated experience of it helps us to construct

---

14. Ayer : *Probability and Evidence*, p.134

generalized causal proposition. What we call the generalized causal statement is nothing but a generalization from the singular causal statement. A singular causal statement is about a particular causal relation that operates between the events at observable level. This causal statement is partly factual because the relation between the events is a fact. The factual content of the singular causal statement consists in an assertion of the existence in such and such spatio-temporal relation of the states of affairs which it conjoins. Now, we establish universal causal statement by the arrangements of particular facts which we have already experienced by assuming that in future they will occur under similar circumstances. Ayer calls that this process of establishing universal causal proposition is imaginary and regards it as statement of tendency. On this version, such statements have no unrestricted truth-value, for causal statements are only partly factual. At the observable level, the factual content of a universal causal statement is that of the corresponding factual generalization, According to Ayer, all generalizations (or universal propositions) are not causal generalizations. He speaks of four types of cases of generalizations which are called causal. First, there is a generalization which falls under a well-established wider theory, for example, the statement regarding the gravitation. Second, there is a universal generalization consisting of 'because' clause, i.e., the clause that speaks of the effect which emerges from the composition or structure of an object. Third, there is some general proposition about the state of disposition or mind which causes some effect invariably. Fourth, we have some generalization about causally linked state of affairs, i.e., the relation between events.

One important problem arises here regarding the causal relation. Ayer holds that we can not perceive the causal relation like other observable facts. It is not a distinct event like cause and effect. But some philosophers like Ducasse hold that the causal relation is a concrete event. Consequently, it is an observable fact. When we perceive the change in our every day experience, we equally observe the causal relation. Ducasse says, "we observe it whenever we perceive that a certain change is the *only* one to have taken place immediately before, in the immediate

environment of another".<sup>15</sup> But it is argued that the causal connection does not have the same status as that of colour, smell, sound, etc. Again, we do not have the way to know it to be true. Yet we do hope that this causal relation is true and it is true for our practical purposes. Here we suppose this to be true, and as such it is a postulate. This status of the causal law can be made explicit by reference to Popper's interpretation. According to Popper, every organism possesses the capacity to make responses to impending events. He says, "Thus we are born with expectations; with 'Knowledge' which, although not valid apriori, is psychologically, or genetically apriori, i.e., prior to all observational experience. One of the most important of the expectations is the expectation of finding a regularity".<sup>16</sup> But Ayer also unambiguously states like Hume and Russell that causality is a regular sequence. He may have some differences in opinion on some aspects of causality, but he has no objection to accept the Humean tradition of the concept of causality. Ayer says, "Accordingly, he placed the source of the supposed necessity in our mental habits of association, and for all practical purposes equated causality with regular sequence. Though his theory is open to objection on some points of detail, I have no doubt that on central issues it is entirely right".<sup>17</sup> It is equally obvious to us also that the central theme of the empiricist account of the causality is the same that causality is a de facto regularity. All the empiricists argue along the line of Hume that there are neither nor have to be any truly physical necessities. The idea, or the pseudo idea, of causal necessity is just an empty shadow of our own mind's throwing, and hence all are really nothing but only regularities of non-necessary constant conjunction.

---

15. Ducasse : *Truth, Knowledge and Causation*, p.9.

16. Popper : *Conjectures and Refutations*, p.47.

17. Ayer : *Metaphysics and Commonsense*, p.76.

## **CHAPTER-IV**

### **A SYNTHESIS OF RATIONALISM AND EMPIRICISM**

#### **4.1. Kant's Transcendental Approach :**

We have tried to outline briefly in our preceding chapters the traditional controversies between the two well known trends of Rationalism and Empiricism together with the views of some later renowned personalities belonging to the two respective groups. These attitudes, as we found out there, are still uncompromising. The two features of the concept of causation which appear to be dominating throughout these two trends are : (i) There is a direction of cause, i.e., the cause is prior to the effect, and the effect succeeds the cause, and (ii) There is some intimate relation between a cause and its effect. We have seen that these two aspects of causation did not receive any adequate account as it is evident from the divergent opinions among these philosophers. In so far as the aspect of direction of causation is concerned, it has come to our notice that all the empiricist philosophers have accepted the priority of cause to its effect, and favoured the view that cause and effect are a mere sequences of events. On the other hand, we find the disagreement among the rationalists on this issue. Some thinkers have supported the priority in the causation, while some of them have flatly denied it and accepted the identity-relation between cause and effect on the pain of the infinite regress. But the aspect of the relation (intimate tie) is the vital issue here. We see the philosophers encountering a lot of complexities in handling the problem adequately. The empiricists in general could not supersede the Humean conclusion that causation is only a de facto regularity of the sequences. In our experience we observe the regularity in the succession of events and form the idea of causation on its basis. The concept of causation from this epistemological standpoint provides no objective necessary relation. The reason is that this sort of relation is not available from the de facto regularity in the mere succession of events. The rationalists, on the other hand, are

in favour of the view that the causal relation is an objective necessary relation; it is the inherent nature of a cause to produce an effect, and it does so necessarily. Spinoza holds causal determinism that follows from the very nature of God. Everything comes into existence from the divine nature as it follows from the nature of a triangle that the sum of its angles are equal to two right angles. Thus things as effects are necessarily related to the Causa Sui (First Cause) as the deduction of a conclusion from its principle. Now Hegel identifies both the cause and the effect, and regards them as only the two stages in the self-development of the Absolute Spirit or Absolute Intelligence. So the process from the cause to its effect is not only spontaneous but also self-determined. Also, there is a logical consistency in the self-developing system of the Absolute, and one stage in this process is logically implied by the other stage as the ground. In Bradley's view, the causal relation is a process of reasoning from premise to its conclusion, and hence, the relation is necessary or logical. It is thus obvious that the majority of these philosophers have a tendency to admit the Causa Sui as the ultimate cause or the root cause of the worldly objects. Now, they have, first, identified the Causa Sui with the logical ground or the logical premise, and, second, they have argued that the relation between cause and effect is as necessary as the logical relation of dependence of a derived conclusion on its premise. This causal theory, thus understood, appears to be erroneous because they have confused the real cause with the logical ground or premise. Again, these philosophers are also mistaken in holding that the metaphysical relation of the Causa Sui to its effects which make up this world is objective or necessary. is only an ideal construction as Bradley himself also points out. If so, this objective or metaphysical relation is certainly different from the logical or inferential relation established by us between a premise and its conclusion. Thus, the rationalists spend their time only in an airy speculation, while the empiricists can have no right to assert any objective necessary relation in the objects of the external world. In this case, we may refer to Kant's position as an escape alternative.

While dealing with the problem of causality, we find in Kant the spirit to reconcile



both rationalism and empiricism by trying to remove the draw backs already involved in both these treatments of the concept in question. This drawback, according to Kant, is entirely the outcome of their dogmatic approach. The empiricists admit only the role of sense experience in the construction of our knowledge proper, while denying at the same time the contribution of reason or understanding in this context. The rationalist, on the other hand, hold that reason or understanding alone is the true source of our knowledge but denies the role of sense-experience in the construction of knowledge. Kant is opposed to such dogmatism because we cannot deny that our sense-impressions stimulate our knowledge but human knowledge does not end with it. On the contrary, it tries to go beyond the mere sense experience to construct a universal and necessary knowledge regarding the world. Kant says, "Experience tells us, indeed, what is, but not that it must necessarily be so, and not otherwise. It therefore gives us no true universality; and reason, which is so insistent upon this kind of knowledge, is therefore more stimulated by it than satisfied. Such universal modes of knowledge, which at the same time possess the character of inner necessity, must in themselves, independently of experience, be clear and certain. They are therefore entitled knowledge a priori; whereas, on the other hand, that which is borrowed solely from experience is, as we say, known only a posteriori, or empirically".<sup>1</sup> So Kant argues that the one sided approach to the concept of causality must be doomed to failure. Here he points primarily to Hume's criticism of the concept of causality which is also prevalent in its later tradition. Hume denies the universality and necessity in causal relation on the ground that the necessary bond between cause and effect can neither be perceived nor logically demonstrated. Hence the principle of causality is neither empirical nor analytic and he, therefore, concludes that it is nothing but an invention of our mind. And the relation of causality is simply an idea which we add to the perceived succession in time. But Kant does not support Hume, and says that the concept of causality can not be derived from the mere repetition of facts in a uniform succession for the simple reason that the causal

---

1. Kant : *Critique of Pure Reason*, p.42.

relation in that case would be contingent, without being universal and necessary. Knowledge based on experience has contingent truth-value; it may be true but not so necessarily. Again, the inductive generalization gives us only the comparative universality because it is derived from the observation of limited number of empirical facts. Thus the empiricist epistemology has certainly its boundary; sense-experience can not extend our knowledge very far, and the empiricist principle can not help us to know the universal and necessary causal relation from sense-experience and induction, Kant observes that the Humean position is necessarily the outcome of his confusion of the subjective necessity with the objective necessity in the causality. Though it has the subjective origin, yet it is a truth which is independent of all experience and which makes our experience of the events possible. So Kant points out that we can not, like Hume, argue that experience continuously presents examples of the regular succession of the appearances on the basis of which we can easily abstract the concept of cause, and at the same time its objective validity is verifiable by reference to this situation. Because in such a case we will simply overlook the fact that the concept of cause can never arise in this way. Thus, the concept of causality, according to Kant, must either be grounded *a priori* in the understanding or must be abandoned as a phantastic construction of our mind. Here Kant favours the first alternative and holds that the concept of causality is an *a priori* category of the understanding, a transcendental element which makes our knowledge of events possible; it does provide the universality and necessity to our knowledge of such phenomena. So Kant has a tendency to put our reason or understanding in an important place to explain the concept of causality as universal and necessary. Though we, as Kant holds, start with experience of facts, the faculty of understanding has the capacity to establish the universal and necessary causal relation among the facts, and thus synthesises them through the category of causality. Kant claims that his transcendental idealism can solve not only the empiricist's problem of the concept of causality but also the rationalist's metaphysical notion of it, showing that this concept of causation has its origin in 'pure understanding'.

Kant's treatment of the concept of causality is found in the Metaphysical Deduction and in the Transcendental Deduction of the categories, but he provides the proof for this concept in the Second Analogy. The first part of the Transcendental Analytic is called the Metaphysical Deduction of the categories of the understanding. It deals, in fact, with the "discovery of the categories" from the system of judgments of formal logic. But Kant is concerned with the discovery of the categories in the section "The clue to the Discovery of all Pure Concepts of the understanding", a section often referred to as 'the metaphysical deduction' of the categories. Kant believes that there are twelve and only twelve categories, i.e., twelve and only twelve pure concepts of the understanding. Now, making a judgment means using a concept, and since understanding, according to Kant, is the faculty of making judgements, it can, therefore, be said to be the faculty of making judgements by using concepts. If so, then the form of the judgment must therefore be an expression of that category or those categories which are used. Then it seems clear that we can discover the fundamental concepts of the understanding, which Kant calls 'categories', by an examination of the forms of judgments themselves, and this is what Kant, in fact, did. There are three kinds of judgement of relation, viz, Categorical, hypothetical and disjunctive. In so far as the concept of causality is concerned, the hypothetical judgement alone serves the purpose. This sort of judgment is of the form : If p then q. It says that the truth of one judgement is the ground (or basis) for the truth of the other. Therefore, the hypothetical judgment is a relation between the ground or reason and consequence, for example, "If there is lightning (reason) then there will be thunder (consequence). Kant holds that such hypothetical judgement can not be made except by means of the concept of causality, and hence, causality is the category here. Thus the Metaphysical Deduction hints that the category of cause and effect has something to do with the hypothesis or conditional form of judgement. We have seen that a hypothetical judgment depends on the relation between the ground and the consequence but its intention is that if the antecedent or ground is given the consequent follows necessarily. In the same tone, Kant speaks of causality as something which is of such a nature that if it is posited, something else must

thereby also be posited necessarily. So the concept of causality makes a strict demand for the necessary connection between cause and effect. Kant in the *Metaphysical Deduction* has simply shown that there is the 'category of causality' which we actually use. In the *Transcendental Deduction* he has tried to prove or demonstrate that our employment of the category of causality is legitimate, i.e., we are *right* in using this category of the understanding. The manner in which the concept of causality can relate *a priori* to the objects is called the transcendental deduction. Here Kant argues that categories are the apriori conditions which make our experience possible. The objects of possible experience are synthesised by the apriori categories, and if it is not so synthesised, then we would have no experience at all. This synthesis is the act of the understanding; it establishes the connection between the sense impressions and transforms them into the object of our experience. This synthetic activity can not be given by the objects themselves because then the relation would be empirical and it is never possible a priori: Now, according to Kant, there are two conditions under which alone the knowledge of an object is possible, viz, intuition and concepts. Through intuition sense manifold is given to us, while through the concepts they are arranged and thus thought of. In that case all empirical knowledge of objects would necessarily conform to such concepts because it is only on this presupposition that there is anything possible as *object of experience*. Now all experience does indeed contain, in addition to the intuition of the senses through which something is given, a concept of an object as being thereby appearing. "Concepts of objects in general thus underlie all empirical knowledge as its a priori conditions. The objective validity of the categories as a priori concepts rests, therefore, on the fact that, so far as the form of thought is concerned, through them alone does experience becomes possible. They relate of necessity and a priori to objects of experience, for the reason that only by means of them can any object whatsoever of experience be thought".<sup>2</sup> Concepts which yield the objective ground of the possibility of experience are for this very reason necessary. But the question

---

2 Kant : *Critique of Pure Reason*, p.126.

arises as to how the subjective conditions of thought can have objective validity, that is, how this can furnish conditions of the possibility of all knowledge of objects. Kant has discussed this problem with reference to the concept of causality. This notion signifies, as we have already seen, a special kind of synthesis. It is evident that through the pure intuition of the sensibility the object is given to us, and that is only as appearance. In the series of appearances there may not be anything which yields a rule of synthesis and so answer to the concept of a cause and effect. But Kant says that this concept of causality demands the strict necessity. It demands that something A should be such that something else B follows from it necessarily. We can derive a rule by way of abstracting from experience but this rule never proves the sequence to be necessary. The strict universality of the causal rule is never a characteristic of empirical rules because they acquire through induction only comparative universality. But there belongs to the synthesis of cause and effect a dignity which can not be empirically expressed, namely, that the effect not only succeeds upon the cause, but that it is posited *through* it and arises *out of it*. Then, to the question as to how the synthesis in terms of causality (and also in terms of other categories) is possible, Kant postulates the single unity or abiding self which he calls the transcendental self. The unity of this transcendental consciousness or transcendental apperception is one under which the synthesis or connection among the sensuous manifold is effected. This is what Kant means by "synthetic unity of Apperception". The connective activity of the understanding is possible only through the synthetic unity of apperception, the one through which the objects of experience first become mine. But by what means is the gulf between the categories and intuitions bridged up? This subsumption would be no difficult if objects and categories were homogeneous, but they are not so. The objects are of sensuous nature, while the categories are mental forms. So here Kant speaks of the third something which is of both the natures, *a priori* as well as *sensuous*. The quality of time is on one side homogeneous with the categories since it is *a priori*. On another side it is homogeneous with objects since all objects can be perceived in time. Therefore, Kant calls the quality of time a transcendental "schema", and the use is called the transcendental schematism of

pure understanding. The schema (the quality of time) serves us an interpreter between the intuitive faculty and the faculty of understanding. And every category has its schema. Thus the schema of time is a frame work of ideal constructions for which the senses furnish the bricks and the understanding the mortar. The operation of the understanding in its use of the idea of time as an interpreter between itself and the sensibility is called the schematism of pure reason. Now, the schema of the application of the concept of cause is the regular succession in time; when we perceive the successions in time, we apply the category of causality and connect them by this relation. Thus Kant holds that the concept of causality gets its application to the perception of events by such a schematic synthesis.

Now Kant in the Second Analogy has discussed the problem of causality with certain proofs. As there are three *modes* of time, there are three "Analogies". In the Second Analogy, Kant has defined the concept of causality, and sets out to prove that all alterations (in the phenomenal world, the world of science and common sense) take place in accordance with or in conformity with the law of causality. He says, "Everything that happens, that is, begins to be, presupposes something upon which it follows according to a rule".<sup>3</sup> Now Kant's proofs in this context may be stated in the following way. He holds that we experience events following one another; there is a contiguity between two events where one is a state at preceding time while the other is at the succeeding time. In perceiving this sort of succession we come to connect the events in time as that which precedes the other, and designate them as cause and effect. What is worthnoticing here is that the faculty of sensibility has not the capacity to connect the two events which are thus different (the cause A is different from B and vice versa). Again this relation is not a mere phantom or a mere imaginary construction; the flow of events has an objective relation. In our perception we only experience one state either before or after another state but not as the preceding state and succeeding state. So this sort of objective relation among the

---

3. Kant: *Critique of Pure Reason*, p.218.

appearances that follow upon one another is not determined through mere perception. "In order that this relation be known as determined, the relation between the two states must be so thought that it is thereby determined as necessary which of them must be placed before, and which of them after, and that they can not be placed in the reverse relation. But the concept which carries with it a necessity of synthetic unity can only be a pure concept that lies in the understanding, not in perception; and in this case it is the concept of the relation of cause and effect, the former of which determines the latter in time, as its consequence —not as in a sequence that may occur solely in the imagination (or that may not be perceived at all)".<sup>4</sup> Thus, our experience, i.e., empirical knowledge of events is possible when the succession of appearances are synthesised by the category of causality.

Now, the question arises as to whether the events, which are thus successive or which follow one another, do so also objectively. We have, as Kant thinks, not yet been able to decide by the above statement as to whether they also follow one another in the object. The word 'objects' here stand for the 'appearances' only, and appearances are called objects in so far as they are related to our consciousness or knowing mind. When it is said that the apprehension of the manifold of appearance is always successive, thereby we mean to say that they are so only to the conscious mind. Now, if the appearances as objects were things in themselves, then we could never be able to determine from the succession of manifold of appearance how the manifold are connected or may be connected in the objects (things-in-themselves). The reason is that we are, from the very possibility of our knowing capacity, confined to the realm of appearances only, and hence, the things in themselves remain ever unknown and unknowable. Though appearances are not things-in-themselves, yet we have to show what sort of connection in time belongs to the manifold in the appearances themselves. Let us take, for example, the apprehension of a house. Here the manifold in the appearance of the house is successive but not the manifold of the house itself, since what I apprehend here is not the house as

---

4. Kant : *Critique of Pure Reason*, p.219.

noumenon or thing in itself but only the house as appearance. Then the question is: how the manifold may be connected in the appearance itself, which yet is nothing in itself? To this, it may be said that what we get through the successive apprehension is called the representations; when they are connected by the formal condition, they constitute the appearance as the object. So appearance can be represented as an object if it stands under a *rule* which distinguishes it from any other apprehension, and necessitates some particular mode of connection of the manifold. If so, it can not be denied that there is equally and obviously the apprehension of succession of events in the case of causal relation, i.e., the perception that follows upon another perception. It also applies equally to all other apprehensions because in these cases also there are successive apprehensions, e.g., in the case of the appearance of the house. So it may be objected that the apprehension of an event is not distinguished from other apprehensions.

The above objection can be replied by saying that the connection between cause and effect has a particular direction, and that is from cause to effect. This is a rule which speaks of the necessary connection between cause and effect. In the case of happening (an appearance) where A is the preceding state and B is the succeeding state of the perception, B can be apprehended only as following upon A; the perception A can not follow upon B but only precedes it. This shows that the connection between cause and effect is always *irreversible*. This can be explained with the help of the two cases of perception, viz, the perception of a house and the perception of a ship floating in a river. When I perceive a house I perceive its roof, floor, walls, windows, corners and the like in succession. In this case of perceiving a physical object like house, the question of the concept of 'irreversible order' does not arise at all. The successive order of the perceptions of these parts may be reversed; they may be perceived in any order. I can, if I choose, direct my glance at the house in such a way that I shall begin at the second time with the part which I left at the first time. Here I can wander my glance from the upper to the lower portions, from the right side to the left side, and, then to perform the same



movement in the opposite direction. Thus, in such a case, the successive order of perceptions is reversible in the simple sense that the perceptions of recognisably the same parts often come in different orders, e.g., wall-window-door, window-wall-door, door-wall-window, and so on. Now, the perceptions of the succession is not the sure indication of an actual succession, Though the parts of the house are perceived one after another, i.e., successively, this case obviously shows that the parts of the house are in reality only co-existent with one another. Kant holds that we are confronted here with the sequence of perceptions which have only the subjective order that is devoid of all relation to the objective time order of events. The objective time order, on the other hand, is not thus reversible, i.e., it is not left to my choice to change the order if I like. According to Kant, there are cases of successive perceptions which exhibit the fair degree of repetition of similar phases in the same order, and hence, this order is irreversible. This obviously refers to the case of the objective time determination of the phenomena called events.

Therefore, in the perception of events, there is a strict rule by which we arrange the events one after another in the most orderly form, and this rule speaks of a necessary order. In the series of these perceptions [in the case of house] there is no determinate order specifying where we have to start, "But in the perception of an event there is always a rule that makes the order in which the perceptions (in the apprehension of this appearance) follow upon one another a *necessary order*".<sup>5</sup> Thus, when I perceive a ship floating down the stream of a river, my perception of its position lower down follows upon my perception of its position higher up the course of the river. What we assert here is that the ship could not come into such a lower position unless the higher position of the ship had preceded. It is thus impossible that in the apprehension of this phenomenon, the ship should first be perceived below and afterwards higher up the stream. It is not left to my choice to apprehend this phenomenon otherwise, for the reason is that the order in the sequence of these

---

5. Kant: *Critique of Pure Reason*, p.221.

perceptions is determined, and the apprehension is regulated by this order. Kant holds that there is an objective sequence of phenomena which determines my subjective sequence of apprehension. He says, "In this case, therefore, we must derive the *subjective succession* of apprehension from the *objective succession* of appearances. Otherwise the order of apprehension is entirely undetermined, and does not distinguish one appearance from another. Since the subjective succession by itself is altogether arbitrary, it does not prove anything as to the manner in which the manifold is connected in the object. The objective succession will therefore consist in that order of the manifold of appearance according to which, in conformity with a rule, the apprehension of that which happens follows upon the apprehension of that which precedes. Thus only can I be justified in asserting, not merely of my apprehension, but of appearance itself, that a succession is to be met with in it. This is only another way of saying that I cannot arrange the apprehension otherwise than in this very succession."<sup>6</sup> Thus, here is a 'must', and that is due to the irreversible sequence in the phenomena that follows a rule. Kant says that one can not connect the higher position of the ship and its lower position with each other without applying the category of causality. It is through this relation of causality and through this alone that the objective time relation of phenomena is determined. If nothing precedes an event on which it must follow according to rule, then all succession in perception would be merely subjective, and nothing whatever would be objectively determined by it as to what was the antecedent and what was the consequent in the phenomena in question. So every phenomenon must follow in time that phenomenon of which it is the effect, and must precede that of which it is the cause. Thus causality is not a merely subjective bond of association of two ideas of events which have constantly gone together in experience in the sense in which the Humean tradition supposed. Causation is not merely an invariable succession but an irreversible one, i.e., an objective necessary succession of two events according to a rule.

---

6. Kant: *Critique of Pure Reason*, pp. 221-222.

Thus we have seen above that there is a preceding condition which the succeeding event follows invariably and necessarily. According to Kant, this happens from the preceding time to the succeeding time, and this direction is not reversible. We can not reverse this order by proceeding back from the event (that takes place) to determine through apprehension that which precedes. This is because appearance never goes back from the succeeding to the preceding point of time, though the former stand in relation to the later. Now, in this case, then, two things follow: (i) The event which follows from the preceding time to the succeeding time is a necessary advance and (ii) the events which happen in time successively, happen according to the law of necessity. This shows that succession of events is not merely subjective, i.e., it does not happen only in our mind; it has an objective reference, too. If there is no such rule that determines the succession in relation to something that precedes, then the mere succession in my apprehension does not justify me in assuming any succession of the object. So when we experience the succession of events, we synthesise these experiences in our mind by following this objective rule. Kant says, "I render my subjective synthesis of apprehension objective only by reference to a rule in accordance with which the appearances in their succession, that is, as they happen, are determined by the preceding state. The experience of an event [i.e., of anything as *happening*] is itself possible only on this assumption."<sup>7</sup> Thus cause and effect are both subjective and objective. He says that we can extract clear concepts of them from experience only because we have put them into experience, and because experience itself is thus brought about only by their means. There is no doubt that we can have a clear grasp of this rule which determines the series of events only after we have employed it in experience. Kant takes this rule to be the ground of *experience itself*, i.e., the condition which makes our experience of changes possible, and it is the condition which always precedes the experience *apriori*. As an *apriori* condition of experience the concept of causality is a universal mode of knowledge and at the same time it possesses the inner necessity. That is

---

7. Kant. *Critique of Pure Reason*, p.223.

why, when we have the experience of the events, that is, the perception of change, our knowledge derives its objectivity, i.e., universality and necessity from the concept of causality as an apriori category of the understanding. In view of the above discussions, there are two consequences. First, the relation between the preceding state and the succeeding state of the sequences is not reversible; we cannot place what happens prior to that upon which it follows. Secondly, if the state which precedes is posited, the determinate event follows inevitably and necessarily. These two sorts of consequences jointly show that in the perception of event when we do have impressions of sequences, there is an irreversible order in which the present event refers to some preceding state as a correlate of the event which is given; and this preceding state stands in a determining relation to the event as its consequence, connecting the event in necessary relation with itself in the time series. However, Kant examines the faculty of knowing in order to ascertain what its apriori elements are, the elements which make our knowledge of objects possible apriori. The faculty of sensibility contains two such forms, viz, space and time. It is a necessary law of the sensibility that preceding time necessarily determines the succeeding time (since we can not advance to the succeeding time save through the preceding time); it is equally true in such a case that the appearances of past time determine all existences in the succeeding time, and these latter as events can take place only in so far as the past appearances determine them according to the law of causality. The causality including other categories of quantity, quality, relation and modality are the twelve categories of the understanding. Kant calls these apriori forms and categories the transcendental elements. So Kant's philosophy is called the transcendental philosophy or his standpoint is called 'transcendentalism' or 'transcendental idealism' in so far as he has undertaken an inquiry into these transcendental conditions which make our knowledge of objects possible apriori. What he tries to assert here is that the confused manifold is transformed by the sensibility by virtue of its two apriori forms of space and time into sense intuitions, while the understanding applies, in its turn, the categories like 'causality' to these intuitions and produces knowledge of

objects. Consequently, the object, instead of determining our knowledge, is really determined by this apriori forms and categories. This is what Kant's Copernican Revolution seeks to assert. So, if whenever we try to know anything as events, we have to employ necessarily the category of causality of our understanding, then the subject matter is, unavoidably, the appearance (i.e., the object as it appears to us through the category of causality). Consequently, we can not desire to know or even to talk about the world of realities or noumena, and can not, therefore, say anything regarding the application of causality to noumena. And Kant denies the ontological reality to the concept of causality. There is no causality in noumena behind the appearances or phenomena; it is real or valid only within the range of appearances.

But Kant's transcendentalism fares no better. His claim is that this standpoint has been able to provide the solution not only to the Humean problem of the concept of causality but also to the rationalist's ontological notion of it. This sort of interpretation appears, in the long run, to be unsatisfactory. Mackie says, "But as an escape from the difficulties Hume encountered in trying to find an 'impression' from which to derive 'the idea of necessary connexion', Kant's treatment is disappointing. He says practically nothing about what the concept of causation contains".<sup>8</sup> We have, first seen that he has provided the metaphysical justification for the notion of causality in the Metaphysical Deduction of the 'pure concepts of the understanding'. All these categories correspond to the logical forms of judgement which we actually use, and causality is one of these categories. And this category derives its justification as a mode of our thinking or knowing. But this derivation is not reliable. As Strawson says, "for anything detailed or specific by way of conclusion, [ Kant's argument ] depends entirely on the derivation of a list of categories from the forms of judgement. We can place no reliance on this derivation".<sup>9</sup> Even if we could rely on this derivation, Kant's argument, as we have seen, would at best prove that every experience embodies some category, and does not guarantee any application at all for any

---

8. Mackie: *The Cement of the Universe : A Study of Causation*, p.89.

9. Strawson: *The Bounds of Sense*, p.117.

specific category such as causation. The conclusion which Strawson says is that any course of experience of which we can form a coherent conception must be, potentially, the experience of a self-conscious subject and, as such, must have such internal, concept-carried connectedness as to constitute it a course of experience of an objective world, conceived of as determining the course of that experience itself. But this is still a long way from a vindication of the category of causation. Besides, Kant's argument in the Second Analogy is very repetitive because here he has made the same point very repeatedly and in various forms, sometimes directly and sometimes by way of a *reductio ad absurdum*. Again, the arguments stated here have been the source of some objections. Strawson has raised one important objection to the very notion of the causal connection, and designated this objection by the name 'simple-minded objection'. Here Strawson argues that the subjective order of impressions in Kant's ship example is not in fact irreversible: ships move upstream as well as downstream, and even a ship which is pointing downstream may be carried upstream by the tide or towed upstream by a tug which I can not see. But here Kant may be supposed to reply that the notion of irreversible relation holds good, and it is justifiable only with reference to the context of a particular situation. When *on a particular occasion* I do see a ship move downstream I am not *then* free to have the impression of its lower position before I have the impression of its higher one. Here Kant may have thought of one kind of sequence where one always has a perception of before and after. For example, the perception of spark precedes and does not follow the perception of an explosion. But this is unsatisfactory, for the intended interpretation of the perception of this regularity is this: it is only where my perceptions of As have so far been regularly followed, not preceded, by my perceptions of Bs that I can interpret each sequence as a perception of an objective A-B sequence. And it is only because there is a rule which ensures that As are followed by Bs with strict universality that I can see each B as following its A in an objective time-order. But what is worth noticing here is that this supposed objectivity is the result of an induction based on subjective succession and it appears to be difficult here as to how we can distinguish this subjective succession from the objective succession in the Kantian sense. Besides,

the point which we want to establish here through the statements is that Kant is here substituting one kind of necessity for another. Strawson in his *The Bounds of Sense* holds that Kant is under the impression that he is using a single notion of necessity as well as its single application. In fact, he has not only shifted the application of the word 'necessary' but also has changed its sense by substituting the conceptual necessity for the causal necessity. Strawson says, "Kant is under the impression that he is dealing with a single application of a single notion of necessity. In fact, he not only shifts the *application* of the word "necessary", but also changes its sense, substituting one type of necessity for another. It is conceptually, given that what is observed is in fact a change from A to B, and that there is no such differences in the causal conditions of the perception of these two states as to introduce a differential time - lag into the perception of A, that the observer's perceptions should have the order ; perception of A, perception of B - and not the reverse order. But the necessity invoked in the conclusion of the argument is not a conceptual necessity at all; it is the causal necessity of the change occurring, given some antecedent state of affairs. It is a very curious contortion indeed whereby a conceptual necessity based on the fact of a change is equated with the causal necessity of that very change".<sup>10</sup> By referring to Strawson's criticism against Kant, Mackie says that an order which is necessary not being reversible in the particular case does not mean that it is necessary in accordance with some universal rule or law. According to Kant, all alterations in the phenomenal world take place in accordance with causal law. When I see a ship moving down stream, I have a succession of subjective impressions, but it presents an objective process or sequence of events. It is that the order in which the impressions succeed one another is determined and irreversible; it is a necessary order and it must conform to some rule which prescribes an objective order from which the subjective order is derived. Here Strawson points out an objection citing the case of cutting down a tree. When I see a man cutting down a log on the far side of a valley from me, I seem one half of the log fell down first and heard the stoke of

---

10. Strawson : *The Bounds of Sense*, p. 138.

the axe next. Now, if I had been close to the person, I should have received these impressions of succession in the reverse order. Mackie says, "The fact that the order of impressions (on a particular occasion) was not one which I was free to reverse does not imply that either they, or an objective sequence of them are perceptions, took place in accordance with a rule. Kant's argument turns upon a blatant fallacy of equivocation, a play upon two different senses of the word *necessary*".<sup>11</sup> Not only the notions of universality and necessity which Kant has ascribed to the concept of causality have been challenged but also his transcendental synthesis has equally been objected for several reasons. Kant has tried to prove that the events are chained by the necessary succession in time - determination. He has introduced the notion of transcendental synthesis to make this clear, but we have already said that such a view has been a psychological doctrine and fails to explain as to how the causal relation is imposed on the succession of events in the actual world. Paton says, "The other way is simply to assert that Kant's doctrine of transcendental synthesis is a mistaken kind of psychological doctrine which need not be taken seriously".<sup>12</sup> But whatever objection may be put forward against Kant, we should admit that the physical system presupposes the necessary connection in causality. In common sense and science, it is an underlying assumption that the concept of causality involves the universal and necessary connection. And there can be no progress in the field of science without this sort of assumption. Ewing supports Kant's contention in this respect, and holds that physical sciences presupposes the universality and necessity in the causal relation, and it is that which Kant has tried to prove in the concept of causality. According to Kant, our mind is not a passive faculty but an active one which actively synthesises the manifold of intuitions which we receive through the sensibility, and produces a new knowledge. We begin with the empirical facts, and then our understanding synthesises them by introducing the universal and necessary relation of cause and effect. And this causal relation

---

11. Mackie : *The Cement of the Universe*, p.104.

12. Paton : *Kant's Metaphysics of Experience*, p. 280.



is one by depending on which we can predict about future events. However, Paton remarks, "In all his arguments Kant is maintaining that unless succession were necessary, we could not experience a world which changes in one homogeneous and continuous time, and that experience which is not experience of such a world could not be called human experience at all. Whatever be the obscurities in his exposition, and however doubtful be the validity, and even some cases the meaning, of the different steps of his advance, I cannot help thinking that at the very least he has called attention to a problem whose very existence is too commonly ignored, and that the solution he suggests has not yet been superseded by any other."<sup>13</sup>

---

13. Paton : *Kant's Metaphysics of Experience*, p.293.

## **CHAPTER - V**

### **THE CONCEPT OF CAUSALITY AND MODERN SCIENCE**

#### **5.1 Modern Science and Indeterminism :**

It is, however, evident from the foregoing discussions that the controversies regarding the concept of causality in philosophy find so far no common point of agreement. And we have also noticed at the same time that neither rationalism nor empiricism nor transcendental idealism is an adequate solution of the problem. The rationalist's interpretation of the concept of causality has a teleological and metaphysical bias which is not amenable to scientific investigation and which falls beyond the reach of the commonsense. On the other hand, the empiricists have made causality only a psychological concept having merely the subjective necessity. Kant has tried to give an epistemological twist to the concept of causality by making the causality both subjective and objective with no successful results. He advanced a series of arguments to prove that the objective succession as distinct from subjective sequence involves a necessary order which is the core of the causal relation. Here Kant argues that the concept of causality is bound up with the irreversible character of time, while this is not acceptable to quantum physics. The quantum physics has advanced arguments in favour of the reversibility in the ultimate process of matter. It does not hold that there is a strict causal relation in the atomic world, rather it argues that the relation is quite uncertain. Eddington who is a staunch supporter of this view argues that the status of the causal law is like that of statistical law. This later kind of law is based on the average behaviour of atom, and such a behaviour does not follow a strict causal law. Hence, we cannot predict any strict causal law on its basis, and, therefore, there is indeterminacy in the causal relation. The recent developments of quantum physics do not postulate strict law of causality that has been supposed by the so called physical science to happen in the behaviour of Nature. The traditional physical science has been characterised by a firm conviction

in the determinate behaviour of physical objects, that is, it has the belief that the physical objects behave according to the strict law of causality.. Consequently, it has presented Nature as a completely causally determined system. The cardinal assumption of this science is that a given state of affairs does uniquely determine the next state of affairs. On this view, it is admitted that we are given all the relevant data about the present state of the solar system, for example, we can predict any future state of that system. If we cannot do so, it is merely because our data are not sufficient. This standpoint essentially leads to the principle of determinism which has been carried on by scientist like Planck and others. According to them, this sort determinism is verifiable in all the phenomena with which science is concerned; we have the power to predict, and it is to be regarded as the test of the correctness of the hypothesis. This deterministic standpoint holds that the phenomena of life and mind are equally tied by the strict causality, and hence, the question of the freedom of the will does not arise at all. These supporters, then, believe that the strict causal relation holds good not only for the man-sized world but also for the world of atomic process. Thus the concept of causality has been a point of controversial issue not only among the philosophers but also among the scientists, and consequently the category of causality has been dealt with by the scientists as well.

This concept of causal relation in the deterministic sense has suffered a rude shock by some scientists like Jeans, Heisenberg, Eddington and others. These scientists are in favour of the causal indeterminism in the field of modern physics. They have tended to hold such an attitude because the latest trend of science in its search for the ultimate "stuff" and the fundamental causal principles operating there are not so much promising. The notion of the atom as constituting the ultimate stuff together with their laws are continuously receiving different shapes due to the brilliant contributions of the scientists like Dalton, Bhor, Newton, Einstein and so on. The result we have got so far is that the ultimate stuff of the physical world is composed of "electricity" which the scientists call "energy". But the study in this field of microphysics shows that the scientists can not know what this energy is; they know only what mathematical ratios prevail in their various

manifestations and nothing else. Previous to the nineteenth century, it is stated that light has only wave property but quantum theory holds that it has both wave property and particle property. And this is certainly one of the most amazing situations ever encountered by any science. Again, there are troubles regarding all the fundamental principles, e.g., the nature is uniform, the law of cause and effect has universal validity, the present is determined by the past and the future will be determined by the present. In the world of microphysics the physicist is not quite at home in the study of the inner mechanism of the atom. He finds, after repeated experiments, that the position of the particle cannot be determined in advance, i.e., the position and velocity of the electron can not be measured simultaneously and the particle within the atom does not move in perfect obedience to the law of causality. All these considerations have forced some scientists to conclude that the universality of the law of causality is violated in the sphere of the infinitesimal size of the atom. Hence, they are definitely of opinion that the law causality has already been abandoned in physics and has no chance of its future reinstatement. For strict determinism cannot be traced in the behaviour of the ultimate elements of the physical world. Such elements include the electrons as well as the quanta or atoms of energy. A quantum of light may take either of the two paths and its movement in either direction is a matter of probabilities. In one experiment the quantum will take one path, but when the experiment is repeated under the same conditions it will follow the other path. According to the supporters of this view, a statistical law of probability can be enunciated from the repetition of experiments, but such a law is not causal in the usual sense of the term. Again we also find the same fate in the case of the movements of the electrons; the chances that an electron will reach a position B from a position A can be given but its future movement is not uniquely determined by its present state. When a sufficiently large number of electrons are taken (in a piece of matter), the behaviour of the assemblage is, however, determinate and thus it seems to be causally determined. But when they are in isolated position, these positions are not causally determined. It may be thought that a closer observation of the electron would ascertain the conditions that cause it to jump one way rather than another. But in order to do this, we have to depend on inference because of the fact that we cannot observe

an electron here. When an electron is involved in interacting with the rest of the universe, only then it can be observed. The electron standing in solitary singleness is like a Lucretian atom; it is, then, unobservable in principle and as good as non-existent. It can be detected only by a process involving atleast one quantum of energy; and this one quantum is sufficient to disturb the motion of the electron in an unpredictable way, Heisenberg propounds the theory of indeterminacy which is called the Principle of Uncertainty; it is also called the Heisenberg Principle of Indeterminacy. It is a new and very interesting principle which he has constructed in connection with the experiments on the behaviour of electrons as waves and as particles. Not only this theory propounds uncertainty in the field of atomic physics but also it has striking repercussions in the field of ethics particularly in the case of the freedom of the will. The strange character of this new principle is shown by the fact that it has been held to destroy definitely the universal validity of the determinism in nature upon which science itself is supposed to depend. Here it seems to contradict the law of causality according to which every event in nature is fully determined by preceding events, the present being strictly the product of the past. The Principle of Uncertainty states that the causality in this strict sense of determinism does not hold good in the field of atom . It is hold that the physicists have means of measuring the velocity and position of an electron as it moves in one of its orbits within the atom. If the laws of mechanics upon which during the centuries science has been able to rely absolutely, hold good in the microphysical world, the experimenter should be able to determine where the electron will be at any given instant. But to their astonishment, the electron is not there but is found to jump about in an erratic, and bewildering manner. It seems indeed to jump from one orbit to another without traversing the intermediate space. What he holds is that an electron may have position or it may have velocity, but it can not in any exact sense have both. In other words, the more exact the determination of the position of an electron, the vaguer becomes its velocity and the more exact the velocity the vaguer the position. But unless both the position and the velocity of an electron are equally well determined, how can we predict its behaviour, the electron being essentially the moving particle, or rather, a "wavicle"? Bohr's early picture of the atom has contained an unobservable element. For we were asked

here to imagine electrons revolving round a central nucleus and occasionally jumping from one orbit to another; but they could be detected only when they were executing those jumps and not while steadily revolving on their orbits. But modern science is chary of all unobservable elements as shown in Einstein's rejection of absolute space. "Heisenberg replaced Bohr's scheme by one that involves only observable factors. This is why the electron is regarded as undetermined in its movements which are jumps we can alone observe."<sup>1</sup> Thus the fundamental difficulty of determining, i.e., ascertaining the place of an electron moving at a certain velocity is expressed in a general way by the uncertainty relation originally formulated by Heisenberg. His theory of indeterminism as already shown above states that the measurement of an electron's velocity is inaccurate in proportion as the measurement of its position in space is accurate and vice versa. And the reason behind his statement of this sort is not at all difficult to find out. We can ascertain the position of a moving electron only if we can see it and in order to see it we must illumine it, that is, we must allow light to fall on it. Now, the rays falling on it impinge upon the electron and thus alter its velocity in a way which it is impossible to calculate. The more accurately we want to determine the position of the electron, the shorter must be the light waves employed, the stronger will be the impact, and the greater the inaccuracy with which the velocity is determined. The statements like the above, although constantly made in recent years, somewhat overstate the said difficulties. What really happens is this : The conditions of measurement are such that it is impossible to determine at a given time the position and velocity of a particle. The very means which we use to determine the one disturbs the other - the measure of one quantity disturbs the determination of a complementary quantity. There is, therefore, a definite limit to the accuracy with which both the position and velocity can be simultaneously determined.

Now, a remarkable new interest has lately been given to the ancient problem of the freedom of the will by the discovery of the Principle of Uncertainty or the Heisenberg Principle of Indeterminacy in the science and physics. As interpreted by some of the scientists, this theory seems to hold that science itself, whose

---

1. Bhattacharya : *Causality in Science and Philosophy*, p.175.

deterministic theories of nature have always presented difficulty in accepting the freedom of the will, has come to acknowledge a certain freedom in the realm of natural phenomena. Since from the beginning of scientific study of natural process it has been argued that nature is uniform, that the law of causality is of universal validity, that the present is determined by the past and that the future will be determined by the present, natural laws rule always and everywhere throughout the universe so that predictability is always possible and reliable. It is on this view that if we know the position of heavenly body and its velocity, we can predict just where it will be at any time in the future. Consequently, the human will as a part of natural phenomena is thus causally determined and has no freedom. But the Heisenberg Principle of Indeterminacy have raised, as we saw before, the question regarding the universal validity of the strict law of causality. Even after a repeated experiment we can not detect such causal determinism in so far as the position of the particle can not be determined in advance by any measurement because they do not follow any strict causal law. The scientists like Heisenberg hold the positivistic attitude that the world of our perceptions is the only world, and our human measurements are the final data for our knowledge of the external world. The unobserved electron does not exist for us and it does not exist in any intelligible sense. If so, it appears that in the world of atom as it is known to us indeterminism exists. We do not know beyond this world of our perceptions that indeterminism does not exist. Now if we believe in the noumenal world in the Kantian sense and also believe that the human will is a part of this noumenal world, then we cannot say that the human will is not determined. Since it is obvious that we, the human beings, are parts of phenomenal world, some sort of indeterminism exists in the case of the human will, and, hence, the argument against the freedom of the will would seem to have lost its force. Though many of us cannot accept indeterminism in the sphere of physical world, yet we should say that no description of these forces in the usual terminology of scientific determinism would be adequate to explain the free activity of our will. Jeans also is an upholder of the theory of indeterminism and says, " In more general terms, we may say that the law of causality acquires a meaning for us only if we have infinitesimals at our disposal with which to observe the system without disturbing it. When the smallest

instruments at our disposal are photons and electrons, the law of causality becomes meaningless for us, except with reference to systems containing immense number of photons and electrons. For such systems the classical mechanics has already told us that causality prevails; for other systems causality becomes meaningless so far as our knowledge of the system is concerned; if it controls the pattern of events, we can never know it."<sup>2</sup> What these statements evidently show is that it is futile to discuss whether the motion of an electron conforms to a causal law or not. When a physicist tries to follow the motion of an electron inside an atom, he can do it only by making it discharge a full quantum of radiation. Now, the emission of a quantum of radiation is so atom shaking an event that the whole motion of the atom is changed, and the result is practically a new atom. A succession of quanta may give us scraps of information about various stages of the atom but no record of continuous change. In fact, there is no such continuous change to record, since every departure of a quantum breaks the continuity. Hence, it is meaningless to speak of the causal determination of an electron inside an atom when it is put under observation and we can not, therefore, argue that the electron is causally determined. Jeans admits that he has not yet been able to demolish the physical determinism as advocated by Planck and Einstein. In fact, he comes in the end to realise that the entire science would be left hanging in the air if the assumption of the uniformity of nature - "like causes produce like effects" - were not justified and explained. The explanation, he says, is of two kinds. In the first place, the sort of indeterminism implied by the quantum theory is confined to the limited process of nature. In the second place, he realizes that even these events which have been called only indeterminate are governed by the statistical laws. Billions of electrons and atoms are also there in all man-sized phenomena, and for the discussion of such phenomena as are perceptible to us, these may be treated statistically as a crowd. But these crowds obey statistical laws which now take control of the situation, with the result that the phenomena can be predicted with almost the same precision as though the future motion of each particle were known. Stebbing says, "In such a case, statistical laws will be the *basis* from which the

---

2. Jeans : *Physics and Philosophy*, p. 144.



predictions proceed, but the predictions will be made in accordance with a deterministic procedure."<sup>3</sup> Jeans says that on the man-sized scale and indeed far below down to pieces of matter far too small to be seen in any microscope - nature is, to all appearances, strictly deterministic; like causes produce like effects. Thus, the uniformity of nature is re-established except in the realm of the infinitesimal, and science can justify the assumption on which her existence rests. But Jeans is not clear about the nature of the causal relation, and he questions the uniformity of nature in the sub-atomic sphere. If, however, it is meaningless to speak of determination where we can not ascertain the causal relation without disturbing it, surely our only conclusion should be that there are no facts against the uniformity of nature. What is, then, obvious here is that Jeans does not support the law of causality or the uniformity of nature but accepts the middle position between the Humean and the Kantian. Consequently, we are led to think that we see cause and effect running through everything, because the phenomena of the man-sized world seem to conform to the law of causality. The reason is not that they obey statistical laws which produce an impression of causality on our organs of perception. Jeans says, "Our experiences of our man-sized world create in our minds habits of thought which take causality and space-time representation for granted. We can not imagine anything else because we have never experienced anything else."<sup>4</sup>

Eddington, however, does not believe in the principle of causal determinism and argues that determinism has lost its root and that it is useless to search for the strict causal law in the domain of modern physics (theoretical). He says, "It is a consequence of the advent of the quantum theory that *physics is no longer pledged to a scheme of deterministic law*. Determinism has dropped out altogether in the latest formulations of theoretical physics and it is at least open to doubt whether it will ever be brought back."<sup>5</sup> Eddington has been influenced by the development of modern quantum physics which, he says, does not hold any strict causal relation in the atomic world. The orbital rotation of the infra particles

---

3. Stebbing : *Philosophy and the Physicists*, p.204.

4. Jeans : *Physics and Philosophy*, pp. 282-83.

5. Eddington : *The Nature of the Physical World*, p.294.

of an atom does not obey any strict causal law, and hence, the relation is quite uncertain. In the year 1935, Eddington says "Ten years ago practically every physicist of repute was, or believed himself to be, a determinist. He believed he had come across a scheme of strict causality regulating the sequence of phenomena."<sup>6</sup> Then the so-called primary sciences had the aim to explain and fit as much of the universe as possible into such a scheme of completely deterministic law. But the question is : what is the ground of so much ardent faith in the orthodox hypothesis that physical phenomena rest ultimately on a scheme of deterministic law ? In this connection Eddington's answer is that there are two reasons on which this conviction was based. In the first place, the principal laws of nature which have been discovered are apparently of this deterministic type, and these have shown the triumphs of prediction in physics. In the second place, the current epistemology of science presupposes the deterministic scheme of this type, "... knowledge of the physical world has to be inferred from the nerve-messages which reach our brains, and the current epistemology assumes that there exists a determinate scheme of inference (lying before us as an ideal and gradually being unravelled)."<sup>7</sup> The so-called physical sciences have been controlled by these and other reasons. The methods, definitions and conceptions of these sciences are so bound up with this deterministic hypothesis that the limits of causal determination were then looked upon as the ultimate limits of physics. The scientists inspired by this idea used to apply this sort of scientific method and thus the causal explanation to all phenomena including both vital and mental, and they did it in the hope of making biology and psychology in a true sense scientific. Thus, what is called scientific explanation is nothing but another name for the causal explanation or causal determinism.

However, Eddington has tried to assert that the causal determinism is to be thoroughly discarded from the domain of modern physics. In so far as we are concerned with the relation in causality, we have seen in our foregoing discussions that sometimes it has been interpreted as irreversible one and it runs one way.

---

6. Eddington : *New Pathways in Science*, p.72.

7. Eddington : *The Nature of the Physical World*, pp. 286-87.

This one way causal relation is called asymmetrical which defines the strict causal law from cause to its effect. Further, there are philosophers who do not allow any sort of irreversibility in the causal relation. They have regarded the causal relation as wholly symmetrical one where it does not run only from cause to effect, i.e., not one way; the relation may come from the other side also. Now, if physical science is classified into primary physics and secondary physics, then we see that primary physics accepts the view that the causal relation directs from cause to effect but this relation is symmetrical. While the secondary physics speaks of causality but does not favour the strict causal law. This position, therefore, really involves the uncertainty principle in the concept of causality. The modern atomic physics is not interested in the strict causal relation, and it believes that A and B happen together. Now this sort of causal relation is based ultimately on the statistical laws, and the latter is again based on the average behaviour of atoms. In the atomic physics the scientists have arrived so far that the quantum jump of an atom is quite uncertain. So, if we want to make prediction about the future, we have to depend on the average behaviour of the atom. Here we say and also hope that the law which remains undiscovered will be as like as the law discovered at present. Eddington says, "Hitherto whenever we have thought we have detected causal marks in natural phenomena they have always proved spurious, the apparent determinism having come out in another way. Therefore we are inclined to regard favourably the possibility that there may be no causal marks anywhere."<sup>8</sup> However, the concepts of causality and generalization are very important notions in his treatment of causation. This is because he has defined the concept of causation in terms of the generalisation. He says in his *'New Pathways in Science'* that causality can be explained as the generalisation from the particular experienced fact. We do experience facts or events, and there we observe the common regular association of two states called cause and effect. On the basis of these observations of two events happening together, we generalise the causal law. Now what is said here is that this is an extreme generalisation from experience. But such a generalisation is not always trustworthy, and, consequently, we cannot be certain about its future

---

8. Eddington : *The Nature of the Physical World*, p. 290.

application and prediction. Thus, statistical laws are really indifferent to the principle of causation. If such is the status of the statistical laws and if causality is explainable ultimately in terms of the statistical laws, or the former is reducible to the latter, then modern physics, according to Eddington, is not at all interested in maintaining the strict causal relation.

It is Eddington's view that modern scientific researches have proved this sort of indeterminism in the atomic physics. Besides, he does not accept the so-called notion of cause as an intrinsic power to produce an effect always. This is because we cannot say before hand by observing the thing when it is placed before us that such and such effect will be produced from it. We cannot say before hand what the exact reading of weighing machine will be when a body is placed on it. This shows that a body has no such intrinsic nature as mass, velocity, etc which will produce an effect necessarily according to its nature. The cause has no intrinsic power to generate an effect always and, therefore, there is no strict causal relation between cause and effect. Like other philosophers of this tradition Eddington also holds that causality is a succession of events in time, and hence, this time factor is also included in the concept of causation. Thus he thinks that a cause is one which precedes the effect and the effect is naturally the succeeding state of the cause, implying no relation of necessity. According to him, whether or not there is a causal scheme at the base of atomic phenomena, modern atomic theory is not now attempting to find it out, and it is making a rapid progress because it no longer sets this up as a practical aim. Both the quantum physics and the physical world may be regarded as thus indifferent to the view that there is any strict relation between cause and effect. If there is no absurdity in thinking of causal indeterminism in the sub atomic process, then there should be no difficulty in thinking of the physical world as wholly made up of the "whimsical" elements, and hence that the physical world, too, is causally undetermined in its happenings. Here we should not go on arguing that causal determinism has been disproved but we should rather say that such a determinism has to be proved itself yet. Science has not been able to produce enough evidence in favour of determinism. In so far as the causal determinism is based on the statistical law which is itself further

based on ordinary experience, we have to consider this determinism as wholly an 'unsupported hypothesis'. So, Eddington remarks, "It is impossible to trap modern physics into predicting anything with perfect determinism because it deals with probabilities from the outset."<sup>9</sup> Herbert Dingle has, however, supported Eddington's view that the law of causality is statistical law which is undetermined. He observes that Eddington has been able to overcome the dogmatism which really shrouded the concept of determinism which was held by the earlier scientists. He says, "I think Eddington is right in his contention that those who claim causality and even determinism - as a necessity of thought are more dogmatic than those who take the contrary view. My reasons, however, are totally different from his. To me he seems to remove the dogma of causality and substitute that of statistics."<sup>10</sup> What he wants to indicate here is that the contention to establish determinism seems to be paradoxical from the standpoint of our consciousness which is the epistemological subject here. It is an undeniable fact that our consciousness or mind in its knowing activity establishes the relation among experiences. Hence, it implies that outside our consciousness we cannot possibly know anything, for in that case it would be a contradiction in term. Then our knowledge of electrons, light, etc., shows that they are no more external objects which lie outside our consciousness but which my mind has actually created and established the relation among my experiences. This sort of epistemological standpoint seems to imply no inherent necessity or causal determinism among the phenomena that we experience. Consequently, the concept of causality is only a regular sequence of events where we say that a cause is always associated with its effect, and that we assert only on the basis of our past experience. In no case, the concept of cause compels us of inherent necessity to predict the effect; the same cause will produce the same effect is only a matter of our belief. If so, then causality in modern science is only a probability, no better than a statistical law. Many scientists have now a tendency to favour the view that causal laws are approximately valid, and do not support the view that the sequences of events involve any necessary relation. So we can arrive at the conclusion that even modern science cannot but accept

---

9. Eddington : *New pathways in Science*, p. 105.

10. Dingle : *Through Science to Philosophy*, p. 309.

the Humean concept of causality and nothing else.

## **5.2 Modern Science and Determinism :**

We have noticed in our previous discussion that the principle of indeterminism has ultimately led itself to favour the Humean concept of causality. We have seen Eddington saying that determinism in the traditional sense faded out of theoretical physics. The most significant question here is whether the law of causality obtains in the happenings of nature as we know them. The inevitable answer seems to be that causation in the sense of producing its effect always or necessarily does not belong to the physical world and the realm of the subatomic processes. Consequently, if we mean by the concept of causality the necessary relation between cause and effect, then we must conclude here that the subatomic world does not display any such causality among its elements. This conclusion is due to the fact that electrons which are among the ultimate constituents of the physical world seem "whimsical" and unpredictable in their movements. In this connection, we have seen that Heisenberg's principle of indeterminacy expresses the fact by saying that we can not determine with equal accuracy both the position and the velocity of an electron at any moment. The development of relativity theory (Quantum theory) is also a challenge to the physical causality or determinism. It is the claim of the relativists that the dictum 'every event has a cause' is broken down. Pap says, "... such events as individual electron jumps from one atomic orbit to another, or impacts of individual electrons at particular positions on a screen or disintegrations of individual radioactive atoms, are not predictable. And such prediction is alleged to be not only practically but even theoretically impossible."<sup>1</sup> Now, against this sort of indeterminism of modern physics there are some scientists who argue that indeterminacy is not proved by experiment, and hence, the indeterminacy of subatomic processes is only theoretical. Their contention is that this indeterminacy is a subjective indeterminacy or uncertainty not justifying a conclusion as to objective facts. Planck, Einstein are chiefly the faithful advocates of the principle of determinism. But Planck's view is of special

---

1. Pap : *An Introduction to the Philosophy of Science*, p. 307.

importance because he is the father of the quantum physics that has undermined the empirical support for the doctrine. According to him, it is not the principle of causality itself which has broken down in modern physics, but rather the traditional formulation of this principle. Since the empirical observation does not help us to follow the movement of each individual molecule in its very intricate labyrinth of processes, it need not be supposed thereby to imply that there is no strict law of causality operating in the subatomic stage. So Planck says, "And the non-fulfillment of the statistical rule in particular cases is not therefore due to the fact that the law of causality is not fulfilled, but rather to the effect that our observation is not sufficiently delicate and accurate to put the law of causality to a direct test in each case. If it were possible for us to follow the movement of each individual molecule in this very intricate labyrinth of processes, then we should find in each case an exact fulfillment of dynamical laws".<sup>2</sup> Thus the validity of the law of causation for the world of reality is a question that cannot be settled down only on grounds of mere empirical abstraction which we did find in the attempts of the scientists like Eddington and others. Our observation must be made sufficiently delicate and accurate in order to find out the rigid determinism, and if it would be possible for us, then we could see that the movement of each molecule must follow the strict causal law. Planck in his book *Where Is Science Going ?* has introduced a scientific method which is a valuable contribution in Science. It is interesting to know what method is pursued by this distinguished founder of the new quantum physics, which has done so much to revolutionize physical science. In the first place, Planck flatly rejects the theory of the Positivists that we know nothing of the world beyond our own immediate sensory experience, and that we have no concern with any such world. To the positivist any object, such as a house or tree, is just a complex of our immediate sensory perceptions. According to them, it is meaningless to say that at the back of the sensory experience there is a real object. Planck rejects this positivistic theory and believes that science today rests on a broader and more stable foundation. It makes the postulate that there is a real external world existing independently of our knowing processes, although

---

2. Planck : *Where is Science Going ?* p.145.

this world is not directly knowable. This world is indirectly knowable and the complete knowledge of it is a goal ever to be approached but never to be fully attained. According to him, the means through which the scientist comes to know the nature of the physical world around us are *measurements*. In making these measurements and in all our observations and experiments we must use every effort to eliminate all sources of error arising either from our instruments of research or from subjective tendencies of our sensory organs. These measurements and observations constitute the raw material which the scientist uses in constructing the picture of the external world. So, to the question 'how is this picture gained?', the answer is that the all-important thing is the constructive work of the scientist himself, he must make us some 'hypothesis'. He may give rein to his own spirit of initiative and allow the constructive powers of the imagination to come into full play. He must try to organise into one law the results of his experiments and experiences. The hypothesis must be free from inner logical incoherence, and the deductions from it must agree with the research measurements and experiments. And consequently, Planck's description of scientific method shows how largely science springs from the mind of the scientist. Planck asserts that the strict causal law is to be found in all the branches of knowledge like physics, biology, psychology, and so on. Consequently, these areas cannot avoid causal determinism in any way. In classical dynamics, mechanics in the law of gravitation and electrodynamics, the law of causality has been formulated for exactness and strictness. If the spatio-temporal conditions are known, we can predict all happenings in any given physical picture, and it may be expressed by a system of mathematical equations. Planck says, "According to the law of causation as expressed in the equations of classical dynamics, we can tell where a moving particle or system of particles may be located at any given future moment if we know their location and velocity now and the conditions under which the motion takes place. In this way, it was made possible for classical dynamics to reckon before hand all natural processes in their individual behaviour and thus to predict the effect from the cause."<sup>3</sup> In this connection, it should be

---

3. Planck: *Where is Science Going?* p. 142.



noted here that the quantum hypothesis has been responsible for the disputes into the system of classical relativist physics. Because of this quarrell, some scientists tend to hold that we can not say anything about the influence by which the fundamental physical law can be formulated. But Planck firmly believes and says, "... the quantum hypothesis will eventually find its exact expression in certain equation which will be a more exact formulation of the law of causality."<sup>4</sup> Besides this law of causality, physical science accepts statistical laws. But such laws cannot go without the strict law of causality because in each case of statistical law there is an assumption that the strict causal law is working. When we find in a particular case that the statistical rule is failing, it is not due to the fact that the law of causality is not holding good but due to the fact that our observation is not accurate to follow the law of causality in the right direction. If we can follow the movement of each molecule in this very complicated processes, then we should be able to find out the exact fulfilment of the dynamical laws. Physical science is using two different kinds of method for its investigation, viz, macroscopic method and microscopic method. The macroscopic method deals with the object of investigation in a broadway or in a symmary manner. Here the observers deal with big quantities in wholesale manner and hence, chance and probability exist only to these macroscopic observers. These observers remain content with the mass value and know only the statistical laws. On the other hand, the microscopic method is more complicated; it tries to know all the details in its procedure. These investigators try to know the individual values and apply them to the dynamical law. This method is used to the search of molecules and atoms, and seeks to correct its treatment towards the microscopic degree. Here this microscopic method tries to change statistical law into a dynamic and strict causal process. Consequently, precision and strict causality exist in the microscopic method. Planck here seems to lay an emphasis positively on using the microscopic method for the search of the causality in the subatomic level.

Planck certainly believes in determinism in biological science also. But what

---

4. Planck: *Where is Science Going?* p.143.

is obvious is that the data in such a science are more intricate, and hence, it is very difficult to use and apply the microscopic method in this field of science. Yet the physiologists have been trying to solve the biological problems and arriving at the laws regarding the matter in question. But most of these laws are statistical laws and, therefore, subject to exceptions. When an exception occurs, we cannot blame causal law; it is not due to the failure of any causal law but due to our inability in carrying on the suitable observation and experiment. Planck is here very much confident that biology is now gradually approaching to the explicit assumption of the universal causal relation. He says, "Yet I have no hesitation in saying that even in the most obscure problems, such as the problem of heredity, biology is approaching more and more to the explicit assumption of the universal validity of causal relations. Just as no physicist will in the last resort acknowledge the play of chance in inanimate nature, so no physiologist will admit the play of chance in the absolute sense."<sup>5</sup> It is equally his contention that psychology cannot avoid the the assumption of strict causal laws in its field. The human 'will' is certainly a controversial issue in this connection. There are many thinkers who are of the opinion that the human 'will' is absolutely free. Therefore, an important question arises here : Is determinism applicable to human affairs such as human behaviour or free will? This question can also be put forward in otherwise thus : Are individual human actions governed by any deterministic law like the motion of planets or do these behave like the electrons or photons in being statistically lawful? To clarify this position we may refer to Pap's reply according to which human behaviour is also determined. "Whenever a human with (acquired or inherited) disposition  $D_1$ ,  $D_2$  ... is exposed to an environment of kind E, then he reacts by doing A".<sup>6</sup> So the human behaviour is guided by the principle of causality. He argues that there is no incompatibility between 'free will' and 'determinism'. The alleged incompatibility arises from the superficial sense of 'free action'. A force action is that action which is desired and preferred by the agent. Here Pap wants to say that one must distinguish desiring from deciding. Deciding is not just the desire to perform, for

---

5. Planck : *Where is Science Going ?* p. 147.

6. Pap : *An Introduction to the Philosophy of Science*, p.333.

looking to the consequences of a desire we often decide not to act according to the desire. A free action may be defined as that action which is decided by the agent. So 'determinism' and 'free will' are within the same boundary line. If all the physical forces determining a particle's motion and the particle's initial state are given, then no physicist would allow that it could have moved differently from the way it moved. Similarly determinism entails that given all the causal antecedents, nobody could have desired or decided differently. Planck also is of the opinion that the view of absolute freedom of the human will is not correct. He holds that there is a strict causal behaviour and will is determined. But to infer validly the behaviour of an individual is to depend on our knowledge of his background such as climate, education, environment etc. If it is possible to collect all these data, then it is not impossible to find out the causal determinism even in the case of human conduct and will. Planck says, "Just as at each and every moment the motion of a material body results necessarily from the combined action of many forces, so human conduct results with the same necessity from the interplay of mutually reinforced or contradicting motives, which partly in the conscious and partially also in the unconscious sphere work their way forward towards the result."<sup>7</sup> We must admit here that sometimes we face the problem of explaining human action because of its complexities. But this sort of inexplicability occurs in the case of ordinary people. While the psychologists do not have such problems; they know the reason or cause of human behaviour and will.

Therefore, It is no doubt that Planck is firmly convinced of the view that quantum physics, biology and psychology are to be regarded as strictly deterministic. Though the controversy between determinism and indeterminism in modern science is not an easy issue which can be settled down logically, yet we can not but admit that in physics it is not possible to search for anything new without the presupposition of the principle of determinancy. This is the reason why we have not yet been able to get rid of determinism from the domain of science. Planck has already admitted that we could be able to see the causal

---

7. Planck : *Where is Science Going ?* p.153.

determinism in the subatomic processes if our observation were accurate enough to exhibit all the relevant spatio-temporal conditions. He admits that sometimes we may face the impossibility of applying the causal principle to the inner processes of the atomic physics in the present state of affairs. But he set himself definitely against the view that from this inapplicability we are to conclude that the process of causation does not exist in the external world. To overcome this complexity, he has urged that we must recognise the change of meaning in the term 'event', and has already introduced this meaning when he speaks of the system of mathematical equations with reference to the causal determinism. According to him, theoretical physics does not consider an individual measurement as an event, because such a measurement always contains accidental and inessential elements. He says that in physics we mean by an event a certain merely an intellectual process. It substitutes a new world in place of that given to us by the senses or by the measuring instruments which are used in order to aid the senses. This other world is an intellectual structure and to a certain extent arbitrary. It is a kind of model or idealisation created in order to avoid the inaccuracy inherent in every measurement and to facilitate the exact definition. Such a model does not and need not contain only observable magnitudes at all but only symbols. The adoption of symbols brings one decisive advantage which does permit a strict determinism to be carried through. Now, the laws of the "world image" are all deterministic but the forecast of any event in the sense-world is always subject to a certain inaccuracy inherent in such translation. Planck argues that to conclude that the law of causality as applied to physics has been definitely refuted is to confuse between the world of symbols and the world of sense, and jump to a conclusion without sufficient justification. So it is far more natural to avoid the difficulty by another method, a method which has often rendered good services in similar cases and which consists in assuming that it is meaningless, with respect to physics, to ask for the simultaneous values of co-ordinates and of the velocities of a material point or for the path of a photon of a given colour. Then Planck boldly declares that the law of causality cannot be blamed because it is impossible to answer a meaningless question; the blame rests with the classical picture of the world image. Thus, the classical world image has failed and something else must be put in its place. Planck has the conviction

that quantum physics has done this ; the new world-image of quantum physics is due to the desire to carry through a rigid determinism. The material point which had hitherto been for this purpose a basal part of the world picture has lost its supremacy. It has been resolved into a system of material waves which are the elements of the new image. For determining the conduct of an electron when it impinges on a crystal, it is now possible to apply definite rules of calculation. Hence Planck comes to the conclusion that there is fully as rigid a determinism in the world image of quantum physics as in that of classical physics. The only difference lies in the symbols used and rules of operation employed. The uncertainty in forecasting events in the world of the senses disappears and in its place we have an uncertainty with regard to the connection between the world-image and the world of the senses. In other words, all inaccuracies in the matter are due solely to the transference of the conceptual symbols to the sensory world and vice versa. Planck says that physicists are ready to put up with this double inaccuracy and regards it as an impressive proof of the importance of determinism in the conceptual system. So causality is only conceivable as a form of the theoretical system and is incapable of experimental verification. The statistical laws in Planck's view are dependent on the assumption of the strict law of causality functioning in each particular case. Hence he has said that the non-fulfillment of the statistical rule in a particular case is due, not to the fact that the law of causality does not function, but to the fact that our observations are not sufficiently delicate and accurate to put the law of causality to a direct test in each case. If it were so, then we could be able to see that the strict causality is equally operating there.

Besides Planck, Einstein is also a staunch supporter of the principle of determinism. We cannot but admit a great weight when Einstein asserts that he is entirely in agreement with his friend Planck in regard to the stand which he has taken on the principle. His hope is that determinism is bound to return to the scientific explanation of sub-atomic phenomena and, hence, he had an unshaken faith in determinism. According to him, indeterminism is quite an illogical concept; even the facts can not give us any warranty of our belief in this principle. If we say that the average life span of an atom is undetermined in the sense that it is not

caused, then we are talking nonsense. This is because to say that something is indetermined is to relate it to something else, otherwise this sort of indeterminism will have no meaning. It is only on the basis of the relationship to something else that we can be able to follow the activities of something. Thus, to say that the arrival of a train in Berlin is undetermined is to talk nonsense unless we say in regard to what it is undetermined. If it arrives at all it is determined by something. And the same is true of the course of atoms. This type of determinism does not mean that something must be causally determined in the sense that every event proceeds necessarily from another event which we call the cause. On the contrary, it is to be understood in the sense that it must be related to some other things. So this sort of determinism is subjective and relative. Thus Einstein thinks that the principle of causality has received so far a crude formulation in the hands of the previous thinkers, and much of the misunderstanding is due to this causal interpretation. When Aristotle and the scholastics have explained what they meant by a cause, the idea of scientific experiment has not properly been grasped. They are found to be concerned exclusively with the definition of cause in the metaphysical sense. In this sense every effect is connected to its *Causa Sui* or First Cause with the absolute or metaphysical necessity; here nothing is contingent in so far as the causal relation is concerned. But Einstein does not ascribe the determinism to nature in this sense that every event is produced necessarily from another event called cause. Newton is also dissatisfied with this Aristotelian metaphysical conception of cause; he has described the regular order in which events happen in nature and constructed his system on the basis of mathematical laws. He believes that when we speak of one event being the cause of another, events in nature are controlled by a much stricter and more closely binding law than we suspect today. But Einstein thinks that such a conception is confined to one happening within one time section which is dissociated from the whole process, this rough way of applying the causal principle is quite superficial. He says that we are like a child who judges a poem by the rhyme and knows nothing of the rhythmic pattern, or we are like a juvenile learner at the piano, just relating one note to that which immediately preceds or follows. According

to him, quantum physics has presented us with very complex process and we must further enlarge and refine our concept of causality to meet them. This shows that Einstein is entirely in agreement with Planck. We have seen that Planck believes that science is a conceptual picture of an independent world which it tries to represent. Here the view of atom is a mere mathematical device, justified by its calculated results which are confirmed by experiment. This mathematical analysis must conform to certain essential features of the electron but this knowledge which is so confined to mathematical specification has not yet been able to lead us to be in a position to infer the nature of the physical reality that is supposed to obey this specification. This position too is a consequence of the view which has set up a distinction as well as a barrier between knowledge and reality which is supposed to have an independent existence of its own. This amounts to the acceptance of the representative theory of knowledge which has its own difficulties and which has been confronted by Einstein's theory of Relativity in its metaphysical setting. According to this theory, we cannot get hold of the absolute reality which lies independently of our knowledge. If ultimate reality is thus independent of us, we cannot suppose that our categories and concepts ever represent it adequately, however hard we may try to refine and enlarge them. Indeed all our ideas are only human ways of apprehending reality and it is questionable whether any knowledge of the independent reality is available in the sense of being an accurate picture of it. In this case one may regard that the physical world is causally determined but the laws which we ourselves discover are only approximate generalisations not based on any causal determinations. Therefore, Einstein seems to hold here that this current quantum physics is not based on the principle of causal determinism, although it regards the physical world as causally determined through and through. But he recognises no barrier between knowledge and reality and as such makes science to be concerned directly with the physical world. That is why, he is all out for making science thoroughly consistent with the law of causality and holds that the validity of scientific laws rests finally on the law of causality. But it may, however, be asked whether

this realistic outlook of Einstein may be justified by his own Theory of Relativity. We know that the realistic outlook is bound up with the assumption of the bifurcation of nature into the knowing subject and the object known, and it is this distinction on which the older physics is based. The Theory of relativity (1905) first shows that this can not be entirely so; the picture which each observer makes of the world is in some degree subjective and thus only relative. Even if the different observers all make their pictures at the same instant of time and from the same point of space, these pictures will be different (unless the observers are all moving together at the same speed). If so, no picture of reality drawn by us can be objective in an absolute sense. In this sense, we can never get hold of an absolute; it is meaningless to refer to it at all and regard it as the ultimate real. The world of our experience is a joint product of the subject and the object. It is the only world which is real for us, and the laws discovered by us are true of this world and not of any other. Therefore if the statistical laws do not need any support in the law of causality, such laws do not by themselves lend support to our belief in physical determinism. But no laws discovered by men are final and hence such statistical laws may at some future date turn out to be inadequate or they may perhaps be shown to be consistent with the general law of determinism. At present, however, we would not be justified in concluding from such laws the presence or absence of determinism in the physical world, even though they have been formulated in order to meet the peculiar conduct of electrons. Philipp Frank says, "We know today that with the help of positions and velocities we can not set up any causal laws for single electrons... This does not exclude the possibility, however that we shall perhaps some day find a set of quantities with the help of which it will be possible to describe the behaviour of these particles in greater detail than by means of the wave function, the probabilities."<sup>8</sup>

However, the latest position is that the assumption of the law of determinancy

---

8. Philip : *Modern Science and Its Philosophy*, p.123.



is essential. In physics, it is not possible to search for anything new, without this assumption; it has been accepted as the underlying principle of scientific inquiry. The concept of causality means the necessary connection without which the physical system is meaningless. Ewing says, "That there is enough uniformity in nature for science to develop successfully has been shown empirically by the history of science itself, but science could never have been started without presupposing causality."<sup>9</sup> Indeterminism or uncertainty arises because our knowledge about the atomic rotation is inadequate and our microscopic experiments are not accurate and if it is not so, causal determinism is unavoidable. Harris says, "In the course of the process of change, these relations do not change and are, in fact, irreversible, not because the temporal reality is static - quite the reverse, because the metric is a fixed scale, within which the divisions and demarcations stand in mutual relations that are of necessity unalterable."<sup>10</sup> Popper also holds that we cannot avoid the idea of causation and its determinancy. He says, "The belief in causality is metaphysical. It is nothing but a typical metaphysical hypostatization of a well-justified methodological rule - the scientist's decision never to abandon his search for laws. The metaphysical belief in causality seems thus more fertile in its various manifestations than any indeterminist metaphysics of the kind advocated by Heisenberg. Indeed we can see that Heisenberg's comments have had a crippling effect on research"<sup>11</sup>. So the principle of indeterminism as upheld by Eddington and others is not, in fact, real. The recent scientists have a tendency to support Planck and Einstein. Stebbing holds that Eddington in fact denies the illusion of the older concept of determinism which was held by the earlier scientists. But the determinism is not at all an illusion as considered by the recent thinkers. Against the principle of indeterminism we may, then, argue that these scientists are basically interested in replacing it by the principle of determinism because it is not possible to search

---

9. Ewing : *Kant's Treatment of Causality*, p.237.

10.Harris : *The Foundations of Metaphysics in Science*, p. 476.

11.Popper : *Logic of Scientific Discovery*, p. 248.

for any law or anything new without assuming this determinancy. It is for this reason scientific thinking cannot but accept the principle of determinism. We are not yet able to assert empirically that there is no hard and fast rule in nature, and that the fact carries this warranty has already been explained by Einstein in the case of the arrival of a train. His intention here is to point out that when something happens, it happens by being related to something else and determinism cannot be avoided in this sense. However, we may interpret this controversy of determinism and indeterminism finally in terms of the philosophical attitude which one holds, and, consequently, it is in some sense a support of a particular philosophy. If we believe that there is a real external world independent of our sense-perceptions and our measurements - a world in which the principle of causality and determinism reign supreme and universal, then we shall see that the principle of Indeterminism arises merely from the limitations of our experiments in the microscopic world of the atom. If, on the other hand, we believe that our perceptions and scientific measurements are the only and the ultimate data for the construction of the order of nature or if we hold with the positivists that science is not concerned with anything beyond our perceptions and our measurements, then we cannot escape the conclusion that there reveals a kind of indeterminism or contingency in the inner world of the atom. Thus, it appears that in the world of atom as *it is known to us*, indeterminism exists. Of the world of reality beyond the sphere of our perceptions, it is, therefore, said that science knows nothing and makes no claim either of indeterminism or determinism. In our world of perceptions indeterminism exists, while we do not know that it does not exist beyond the world of our perceptions. Though all the persons who are tough-minded realists will insist on the universal reign of determinism and the absolute ability of the law of causality, yet it may be emphasised that from the positivistic standpoint we have no logical ground to assert this strict causality, neither we have the ground to deny it, but what we experience is only the sequence of events in time.

This also shows that the recent findings of science have led the scientists essentially to the hot controversy between two opposite views, viz, Determinism and Indeterminism. We have noticed there that, the turning - point due to the discovery is that the electrons which are among the ultimate constituents of the physical world seem "whimsical" and "unpredictable" in their movements. According to Heisenberg's principle of indeterminacy, the strict law of causality does not work here because we cannot determine with equal accuracy both the position and the velocity of the electron at any moment. Eddington also holds that the 'quantum jump' of an atom is uncertain. Then the question is : what is the status of a causal law ? His answer is that a causal law in modern physics is as good as a statistical law which is based on the average behaviour of atom, and as such it implies the indeterminacy in the concept of causation. On the other hand, some scientists like Planck and Einstein argue that there is certainly the determinism in causality. According to them, there is no doubt that it is difficult to calculate the orbital rotation of atom but it is not due to the fact that there is no causal determinism in the movements of an atom. This alleged failure to detect the strict causality arises because of our experimental difficulties, and hence, the law of causality can not be made equivalent to the statistical laws. Besides, it is not possible to search for any law or anything new without assuming this causal determinism. But it is also equally true that this controversy is not an easy issue which can be solved logically. It may, however, be said that determinism in causality is a claim which remains unproved and, consequently, it is required to be proved positively. On the other hand, we can say against indeterminism that it is not proved by experiment because this sort of indeterminacy arises out of the experimental difficulties. Thus, it appears very hard to settle the issue. We can say here that this difficulty is the outcome of our dividing nature into knowing mind and the reality that is known by us. The mathematical equations of both the forms of the new quantum theory - the wave mechanics and the matrix mechanics - are completely deterministic in form. So far as these equations go, the future of the

world seems to follow uniquely from the past. But what is obvious is that this unrolling is not, however, of the course of events but of our knowledge of them. If so, then we can not know the ultimate realities, and the world of our experience, as Kant holds, is the joint product of the subject and the object. But Einstein, as we have already seen, holds that since the ultimate realities are unknowable entities, it is meaningless to refer to them; rather he says that the world of experience is the only real world for us and the laws discovered by us are, as we have seen, true of this world only and not of any other. Now these laws are mere statistical laws which involve probabilities in future events. If the causal law is thus explained in terms of statistical laws, then causality in science is the expression of the repeated experience which involves probability but no necessity. If so, the concept of causality as adopted by Hume and Mill reappears here. But Whitehead completely disagrees with the Humean concept of causality that we are not directly aware of any necessary relation. According to him, causation is a perceptual fact and we can predict that the future events will be same as the past and the present. Consequently, this standpoint goes equally against the Kantian notion of causality according to which causal relation is not derived from sense-experience but a category of the understanding or the knowing mind. Causality in this sense synthesises the particular facts in terms of cause and effect and provides the universality and necessity to this relation among the events we experience. But causality, according to Whitehead, is not a mere repeated experience as the Humean tradition holds but it is positively a perceptible universal relation. Again this universality is not imported by the category of the understanding as Kant argues, but it is objectively there in the perceptual facts.

Whitehead has, constructed his own theory of causality on the basis of his theory of perception (feeling as he termed). The so-called theorists, according to him, have not been able to interpret the nature of perception properly and hence, their views of causality are based on the wrong conception of perception. The

otion of perception, if properly analysed, involves two modes, viz, presentational immediacy' and causal efficacy. These are two elements which the exponents of the concept of causality have not been able to distinguish. When we perceive something as in our visual perception, our perception in this sense has a limited capacity. If a grey stone, for example, is the object of our visual perception, then our sight can not go very far; it perceives only the sensum grey in the geometric space. But our consciousness perceives so many things than which is visually perceived about the stone. At the time of visual perception of the stone in question, our consciousness can perceive that this stone has a past history and a future too, or that it has weight and can be used in many ways. Whitehead holds that our visual sensation cannot reach all these things but is confined only to the moment of perception. Then the sensum in terms of its spatial region is that which we ordinarily understand by means of sense-perception or immediate awareness, and this is what Whitehead means by 'presentational immediacy'. He says, "Perception which merely, by means of a sensum, rescues from vagueness a contemporary spatial region, in respect to its spatial shape and its spatial perspective from the percipient, will be called 'perception in the mode of presentational immediacy.'"<sup>12</sup> Now the presentational immediacy, according to him, only reports the contemporary world with its relationship with the perspective background. The contemporary world does not give us any information of causal relations among the events. The events A and B are said to be contemporary if they are free from any sort of influence on each other. We are here instantly or immediately aware these events i.e., the awareness of the events which is called a cross section of the world. He says, "Presentational immediacy illustrates, by means of sensa, potential subdivision within a cross section of the world."<sup>13</sup>

Besides, the presentational immediacy, there is another mode called 'causal efficacy' which whitehead considers to be the most important aspect of the theory

---

12. Whitehead : *Process and Reality*, p. 143.

13. *Ibid.* pp. 145-146.

of perception. It is important for the existence of external world and also for the concept of cause. In order to find out the causal efficacy, we have to search for it in 'the viscera and memory', and it is because of this causal efficacy that the presentational immediacy reports the contemporary world with its relationship with the perspective background, and gets the reference to the past as well as to the future. But this is possible through the 'symbolic reference' which is the interplay or interconnection between the two modes of perception. Whitehead has defined the symbolic reference thus, "The human mind is functioning symbolically when some components of its experience elicit consciousness, beliefs, emotions, and usages respecting other components of its experience. The former set of components is 'symbol' and the latter set constitutes the meaning of the symbols. The organic functioning whereby there is transition from the symbol to the meaning will be called 'symbolic reference.'<sup>14</sup> He holds that this symbolic reference is in need of a common ground. The common ground means here that in every case of our presentational immediacy we get some common components in each particular experience and we directly recognise it as identical in each case of our perception. Now our apprehension (consciousness) brings the experience into a unity of feeling. It comes, then, from the subjective form by means of the similarity or identity of relation which we perceive in a thing or event on various occasions. That is, we find some components in common to the similar world of events. It is on this common ground of perceived events that the symbolic reference is based, we perceive this common ground directly in the presentational immediacy and indirectly in the causal efficacy. Now what is given in the presentational immediacy is given as objectified from the settled past. The objectification of actual events (entities) is the act of reason. Our perceptual process not only includes the particular sense like the sensing of colour, etc. but also includes the whole situation with the geometrical relationship of the external world of the settled past and also forms the potential relationship between the contemporary

---

14. Whitehead : *Symbolism, Its Meaning and Effort*, pp. 7-8.

event and the future one. What whitehead wants to assert here is that from our past experiences of perceptions of events we infer the causal relationship about future events. And our reason establishes the unity between past events and the future ones. In this connection, Whitehead says, "The perceptive mode of presentational immediacy arises in the later, originative, integrative phases of the process of conscience. The perceptive mode of causal efficacy is to be traced to the constitution of the datum by reason of which there is a concrete percipient entity. Thus, we must assign the mode of causal efficacy to the fundamental constitution of an occasion so that in germ this mode belongs even to organisms of the lowest grade; while the mode of presentational immediacy requires the more sophisticated activity of the later stages of the process, so as to belong only to organism of a relatively high grade."<sup>15</sup>

Again, Whitehead's theory of feeling is also a help to understand his treatment of causality. He says that a feeling is our experience of an atomic occasion, and each atomic occasion of our feeling is connected objectively with another. According to Whitehead, our apprehension (consciousness) provides these objectification to the atomic occasions and also produces the conformity of feelings. Now, the simple physical feeling, according to him, is the act of causation; the initial data which is the actual entity is the 'cause' while the feeling about the data is the 'effect'. He says, "A simple physical feeling is an act of causation. The actual entity which is the initial datum is the cause, the simple physical feeling is the 'effect', and the subject entertaining the simple physical feeling is the actual entity 'conditioned' by the effect. This 'conditioned actual entity will also be called 'effect'. All complex causal action can be reduced to a complex of such primary components. Therefore, simple physical feelings will also be called 'causal' feelings."<sup>16</sup> The simple physical feeling is a most primitive type of perception, it does not involve any act of our consciousness. The first

---

15. Whitehead : *Process and Reality*, p.200.

16. *Ibid.*, p.276-77.

stage of simple physical feeling is the creativity which transcends the actual entity. The cause is objectively constitutional part of the effect as being the feeler of the feeling reproduced in the effect with the partial equivalence of subjective form. By the mediation of the cause we find that causal feeling has its objective and initial datum. These antecedent data enter into the feeling of effect. The way from cause to effect is the cumulative nature of time. Now, in simple physical feeling there is a 'vector' character which transforms the cause into effect, it represents the reproductive character of nature and the objective vividness of the past. By virtue of the strength of this feeling, time is conformation of the immediate present to the past which is called by Whitehead 'conformal' feelings. He says, "simple physical feelings embody the reproductive character of nature, and also the objective immortality of the past. In virtue of these feelings time is the conformation of the immediate present to the past. Such feelings are 'conformal' feelings."<sup>17</sup> Now, a simple physical feeling has the character of 're-enaction', 'reproduction' and 'conformation' which have more accurate expression in the eternal objects. These characteristics of the feeling about the eternal physical object give the determinant of definiteness of the objective and the subjective aspect of cause, and effect. According to Whitehead, there are eternal objects determinant of the definiteness of the objective datum which is the cause and there are eternal objects determinant of the definiteness of the subjective form belonging to the effect. Thus, when there is re-enaction there is one eternal object with two-way functioning, namely, as partial determinant of the objective datum, and as partial determinant of the subjective form. In this two-way role, the eternal object is functioning relationally between the initial data on the one hand and the concrescent subject on the other. It is playing one self-consistent role in obedience to the category of objective identity. On the other hand, the subjective form of our feeling belong to consciousness. The raw datum for this subjective form is primary feeling or propositional feeling. These data get a distinct form in the consciousness by

---

17. Whitehead : *Process and Reality*, p.278.



means of alliances. In consciousness the past history of the individual event is collected from the faint recesses of the unconscious. An object takes a definite shape in the consciousness by the act of affirmation, negation and contrast. Emmet has explained this causal theory thus, "So "causation" becomes the reproduction in one actual occasion of the feelings of another, or, more precisely, the conformity of the feelings of the present occasion to the feelings of others. This is particularly important in the case of those routes of successive occasions we call an enduring object for instance, an animal body over a certain interval of time. In this case, we have not simply a bare succession of atomic occasions but a peculiarly full objectification of each successive occasion into the next, so that there is a continual reproduction and conformity of feelings."<sup>18</sup> Thus, it is clear that whitehead's theory of causation is in support of the view that the relation between cause and effect is always universal; it is applicable to the past, present and future in so far as nature is interrelated and dynamic in character. We can perceive this universal causal relation when we perceive two events in succession, and perceive it easily by the reason of our consciousness. At the time of perception, our consciousness plays an active role; it finds the common ground by observing the similarity of relation on various occasions. It is because of this fact that we can establish the causal relation about future events too by our act of reason, and this process is completely based on facts. Here it is obvious that causation, according to Whitehead, is neither merely a matter of habitual expectation nor a category of the understanding (or thought).

Whitehead, therefore, concludes that the problem which we often find in the theories of causation is due to the wrong conception of perception. Accordingly, he is radically different from both Hume and Kant. He blames Hume and Kant that neither of them have understood the problem of (immediate) perception properly. Hume has explained the relation of causality in terms of merely a psychological

---

18. Emmet: *Whitehead's Philosophy of Organism*, pp. 142-143.

habit that arises out of the repetition of the events in succession without having any metaphysical ground. The mind, according to Hume, is a passive recipient which receives the impressions in succession of two events. Now if we seek for the causal connection in the manner of this repetition of the impressions, then the so-called causal relation goes beyond our immediate impressions that we derive through the senses and memory. Hence, if all our knowledge is sense-given, then we do not perceive any such causal necessity in the sequence of impression. And there is, therefore, no place for necessary relation in Hume's concept of causality. Further, if we think that all our knowledge arises out of sense impressions and if our knowledge of causal relation is so sense-given, then this causal relation will have no reference to past and future. This treatment of causality on Whitehead's view is based on the false theory of perception because Hume has failed to distinguish not only the presentational immediacy and the causal efficacy but also the relation of symbolic reference between them. Whitehead says that the idea of 'Causal feeling' does not come from a long association of impressions in the Humean sense. Rather, he says that contrary is the case. One simple instance is enough to perceive the 'cause' and its direct feeling. He holds that we can very well perceive the cause relation when we, for example, blink our eyes the moment the light is given suddenly. It is obviously a fact that here we have the experience of the flash of light and also the clear feeling that it causes the blinking of our eyes. Whitehead thinks that this single cause is enough for us to be sure that the flash of light is prior to the blinking of our eyes as well as the cause of it. This case illustrates well the fact that there is a causal determination in the succession of (two) events which we experience and our feeling of the causal compulsion can not be at all reduced to the habit of expectation. Whitehead conceives that 'Causal determinism' is rather a characteristic of a whole occurrence which extends over a period of time but it is not at all true about a specific sensation. We are directly, aware of this universal relation in causation and this relation is applicable to unknown similar cases in future also. It is a natural

fact because we perceive that a flower always turns towards light, that of flash of light is the cause of blinking our eyes, and so on. But a particular sensation has always a limited applicability, and hence, it cannot extend over a period of time. So, he rejects Hume's doctrine by saying that "Hume's doctrine inverts this relationship by making causal efficacy, as an experience, dependent upon presentational immediacy. This doctrine, whatever be its merits, is not based upon any appeal to experience."<sup>19</sup> Besides, Hume has assumed here that time is pure succession. But what is obviously true is that time is the succession of our acts of experience, and hence, time is not pure succession but our experience, Whitehead says, "Time in the concrete is the conformation of state to state the later to the earlier, and the pure succession is an abstraction from the irreversible relationship of settled part to derivative present."<sup>20</sup> The notion of pure succession can be explained more clearly with reference to the notion of colour. In the later case, it is said that there is no colour as such but only a particular colour like blue etc. In the same way, it can be said against Hume that there is no pure succession of time as such, but we get it through the relation of events in succession, According to Whitehead, this succession of events is not a mere sequence of sense but a well connected experience, and hence we can not accept the Humean view that causality is a peculiar mode of our mind rather than a perceived fact in nature.

Further, Whitehead completely disagrees with Kant to the point that causality is a category of thought. In so far as the Kantian position is concerned, it appears to be the reverse of the Humean tradition. According to Hume, the succession of events is merely a defacto regularity, and hence, there is no strict law of necessity. Secondly, the idea of necessary connection is merely a matter of subjective expectation. But Kant is of the opinion that neither the origin of the concept of causality lies in the repetition of facts nor this necessary relation is a matter of

19. Whitehead : *Process and Reality*, p.204.

20. Whitehead : *Symbolism, Its Meaning and Effort*, p.35.

subjective expectation. On the contrary, it is a category of our understanding. The succession of events are invariably and necessarily connected with each other by the pure intuition of time. The events always happen from the preceding time to the succeeding time but never in the reverse direction. The event which happens in a given time and what follows from this preceding to the succeeding time is a necessary evidence. Here Kant is interested in proving that the events which happen in time successively are thus chained in a necessary succession. Further, we understand the succession by the transcendental synthesis performed by the category of causality. Thus the causal relation is imposed on the succession of events in the actual world. Though we start from the empirical facts, our understanding has the capacity to go beyond these facts and can establish the universal and necessary relation of cause and effect. According to Kant, the category of causality is necessary for our understanding any event. Ewing holds, "Without assuming causality, no cognition or judgement about anything in time would be possible, therefore causality is universally valid of events in time."<sup>21</sup> But Whitehead disagrees with this Kantian position and argues that Kant like Hume has taken the empirical data to stand for 'simple occurrence', and there is nothing in our perception which simply occurs. So far Kant is mistaken because he has considered the notion of time as only 'pure succession'. But there is, according to Whitehead, no pure succession of time; we always get it through the relation of events in succession. We have already noticed in the foregoing discussion of his theory of causality that every happening is universally related with each other such that every particular event has the obligation to be conformed to the past, present and future. We have also seen Whitehead saying that we can discover this universal relation in our experience of particular event, that is, we can directly apprehend the causal efficacy and its application in our perception. In other words, we can apprehend the relevance of the immediate past to the

---

21. Ewing : *Kant's Treatment of Causality*, p.100.

present and from the present to the future. Whitehead claims that this is also a distinct fact even in the lower grade organism. A dog expects the conformation of the immediate future with the same degree of certainty as the human beings do. The common people also think in the line of Whitehead that the causal relation is certain and so it cannot be equated with a mere defacto regularity but, rather, there is a uniformity which we experience in the succession of events in nature, i.e., this uniformity of events in nature which we experience year after year without any exception has positively a logical status. It is also a fact that we are not able to analyse this sort of logical status demonstratively but it is obviously an undeniable fact that planets, human beings and animals have been behaving in the same manner from the time immemorial. This causal relation is not an apriori category but a relation which is thus derived from experiences, and our mind forms such causal laws. We think that there are some strict causal laws which are operating behind all the events of this world. Science cannot carry on its investigation without the presupposition of this concept of causality, and hence, it is the fundamental presupposition of every scientific procedure. However, it is obvious that Whitehead has tried his best to solve the problem of causation with the help of his own theory of perception. But its analysis leads him ultimately to the interesting standpoint that our knowledge of causation is a perceptual fact just like our ordinary perception of anything before us. This is also a conclusion that Whitehead himself is compelled to admit. Then, it seems doubtful to us as to whether the so called universal and necessary causal connection is at all available with expected certainty on the basis of such ordinary perception. Though the preceding events and the succeeding events are observable facts, yet the relation itself is not observable in this sense because we know that it is not any physical entity; what we perceive is only the sequence. Thus, the Humean tradition is still reappearing in Whitehead's treatment of the concept of causality. Loclere in explaining the causal view of Whitehead in *The Relevance of*

*Whitehead* (p.327) says that objects have tendency and purpose to move towards a certain direction. This tendency or habit or disposition is not observed but we can understand it by the result of the activities of the objects even if the link is never found. Following *Venn's* statement in his *The Principles of Empirical or Inductive Logic* (pp. 131-132), we may, therefore, point out that there are certainly some limits to the exercise of the understanding itself, and hence it can not help us to go very far to know this universal connection in question.

## **CHAPTER- VI**

### **CONCLUSION**

#### **6.1 The Source of the Drawbacks in the so-called Theories of Causality: The Confusion of the Epistemological Notion of Causality and the Ontological Notion of Causality.**

We have undertaken so far the inquiry into the nature of causation. In this connection, the important questions are : Is it a mere regularity in the sequence of events or is it a necessary or strict relation between events ? In approaching to this question, the philosophers as well as the scientists have formulated different theories of causality which have appeared in the last analysis to be unsatisfactory. It seems to me that the drawbacks of the so-called theories of causality are based on their confusing attitudes towards the concept in question and this, in its turn, seems to have its origin entirely into their making a further confusion of the two notions of causality, viz, the epistemological notion of causality and the ontological notion of causality. My contention is that in order to solve the problem one should need to delink the two concepts of causality for the reason that we as finite human beings are only able to maintain a commerce with the concept of causality in the epistemological sense but not with the concept of causality in the ontological sense. It is the misunderstanding of this fact that is responsible primarily for giving rise in the long run to the controversies in the concept of causality in both philosophy and science.

In so far as the epistemological notion of causality is taken into consideration, it means our knowledge of causality or the evidential knowledge of causality. The aim of this inquiry concerns itself exclusively with the epistemological question as to how we can and do acquire the knowledge of causal relations. In so doing, we normally depend on our epistemic or cognitive conditions to experience the situation, and on the basis of such cognitively available evidences we proceed to discover causal relation and thereby construct various causal laws. Now, when we speak of the causal relation in this

sense, we generally think of any particular causality, namely, the particular causal relation between the cause event 'A' and the effect-event 'B', and say "A" is the cause of "B". On the basis of the observational evidences or cognitively available evidences we establish this causal relation and formulate causal law. The inevitable outcome of this epistemological standpoint is that the regularities of one sort or another play essentially the most important role in the causation as we know it. At the same time, this interpretation bears the evidence that it is obviously an empirically observable fact and therefore not a mysterious one. Now one consequence that follows logically from this interpretation is that this notion of causality is one sort of relation which is available through the backing of a set of evidences. So such a causal relation may be called a totally evidence-bound causality, and hence a notion like this is always subject to future revision. And the same is equally true of another causal law formulated on this evidential basis. Since this concept of causality as well as the causal laws are dependent on their cognitively available evidences, their status is equally reviseable in the light of the further evidences available later on.

The reviseability status of the concept leads to the following questions : Is the earlier set of evidences misleading ? Or, is the latter set of evidences misleading ? We can hope to provide a satisfactory answer by taking recourse to scientific discoveries because science develops on the basis of available evidences some theories, and formulate theories on its basis. These theories of yesterday are revised later on in the light of new discoveries on the basis of more genuine grounds. Let us consider in this connection some aspects of the scientific researches which Newton and Einstein have made respectively in physics. The Newtonian physics has discovered the law that the mass of a body is invariant irrespective of the state of motion of that body, while the relativistic Physics of Einstein has shown that this law is false. So the question is : who is wrong, Newton or Einstein ? To this, we can reply that if we assume here the strong 'ontological notion of relation' that is operating in the natural objects, then neither Newton nor Einstein nor anyone else knows physics. This is because no body has been able so far to reach the final truth, and, hence, none of them has been able to ensure that anyone knows physics. So, we have to wait till he grasps the entire reality, i.e., he knows the total reality. Now, if we give up the notion of any such transcendent reality and do not go for the knowledge of it as a whole, then this



inconsistency between the Newtonian physics and the Einsteinian physics can be overcome. Here we may say that the law which Newton discovered on the basis of his evidences cognitively available under spatial and temporal conditions was accepted as true. While Newton's law is no longer accepted as true in view of further evidences available at the time of Einstein. Since our notion of reality(or truth) is entirely an evidence-bound notion because we can have no access to the sort of relation that transcends our epistemic conditions or available evidences, it follows thereby that the Einsteinian physics does not falsify the Newtonian law but only supersedes it. So the set of evidences in neither of the above cases are misleading. In this sense, the concept of causality and the causal law constructed on the basis of present cognitively available evidences may very well be reviseable in the light of the more genuine evidences available in future. This epistemological notion of causality and the laws of it have reduced themselves ultimately to the hypothesis which have, thus, the possibility to be revised in future. Consequently, this notion of causality in the epistemological sense is to be understood as the weak notion of causality.

The ontological notion of causality as opposed to the weak notion of causality is to be understood in the strong realistic sense in which it stands directly for the 'causal relation itself. In Hume's phrase it is the causation 'in the objects': The causal relation in this sense is an objective relation, i.e., it is what it is for one thing to cause another independently of whether we know it or not. To put it briefly, the notion of ontological causality is the same as the notion of the evidence - transcendent causality in contrast to the epistemological notion of causality which is totally evidence - bound. Planck says, "The concept of causality is something transcendental, which is quite independent of the nature of the researcher, and it would be valid even if there were no perceiving subject at all."<sup>1</sup> This sort of causality is always used in the strong realistic sense which means that such a relation is never evidence -dependent but evidence-transcendent. It is so because there is always the possibility that our own constructed causal laws or statements carry such meanings and applications which the facts do not bear, i.e., our statements about the causal events (observed in terms of sequences) or situations which we recognise as causal may assert something that is, in fact, not true, i.e., not corresponding to the causation in the objects. It happens because it may be possible

---

1. Planck : *Where Is Science Going?* pp. 156-157.

that the features or some conjunction of features which we think as cause-features and effect-features have been known incompletely, and hence they are neither fully recognised nor discovered at all. If so, the causal concept and law which we have thus built fail to include exhaustively all of these required features. Consequently, the real cause which is operating in the objects of nature remains logically undiscovered and is, therefore, transcendent. It might very well be asked: Can we ever know the real cause? To this our reply is that since our knowledge of causality or causality as we know it rests solely on the total evidential backing that we have at the given spatial and temporal condition, it is not possible for the finite human beings like us to go through the entire set of conditions or evidences causally relevant to its specific effect. It can be known, if at all, only by the infinite mind or God perhaps. This concept of causality is to be understood as the strong notion of causality as distinguished from the weak notion of it. In the light of the foregoing discussions we should have the following consequences. First, the two notions of causality, viz., weak and strong, should be kept separate. Secondly, the notion of weak causality is evidence-relative, while the notion of strong causality is evidence-transcendent. Thirdly, the claim of weak causality is only acceptability-claim but the claim of strong causality is the 'fact-commitment' or 'facticity-claim'.

It seems to be reasonable now to hold that the so-called theories of causality have failed to realize the very need for delinking the epistemological notion of causality and the transcendent notion of causality. The empiricist tradition does not accept anything which is not given through the medium of sense-experience. We have seen that Hume, being a strict and consistent empiricist, comes to the conclusion by analysing the concept of causality that the so-called necessary connection in the causation is not available through observational backing. It is a natural habit of our mind to anticipate that the same effect will be followed by the same cause. The so-called necessary connection supposed to constitute the nature of causality is a mere feeling, i.e., only psychological. Hume says, "For after we have observed the resemblance in sufficient number of instances, we immediately feel the determination of the mind to pass from one object to its usual attendant, and to conceive it in a stronger light upon account of that relation.... The general instances of resembling conjunctions leads into the notion

of power and necessity."<sup>2</sup> This shows that the necessary connection which is supposed to be objective becomes fictitious from this standpoint. Thus losing the ontological or absolute status of the causal relation. Further, if it is a mere feeling or psychological expectation that the same effect will follow the same cause, then no causal connection exists until and unless one perceives it in the form of constant conjunction of two events. Thus, Hume's position 'to be is to be perceived' leads ultimately not only to the acceptance of epistemological causality but also to the denial of the ontological causal relation in the worldly phenomena. This Humean tradition has been carried on more or less in the same fashion by almost all of the empiricist philosophers. But Mill has undertaken a lot of troubles to discover the 'real cause and effect and set forth five methods of experimental enquiry for this purpose. The basic aim of these methods is to infer a general or universal causal law from two sorts of given instances one in which the antecedent 'A' exists and the consequent 'B' follows, and another in which 'A' does not exist and 'B' does not follow, though all other conditions remain the same in both the cases. Mill contends that on the basis of such observation we are able to single out the real cause or effect. But what is most important to note here is that the so-called general or universal causal principle is derived inductively on the basis of observation, and hence, the causal law is only synthetic a posteriori truth which is merely contingent in character. If so, Mill can not solve the problem of necessary relation involved in the concept of causality because it goes beyond the reach of observation. In this connection, Mill has maintained the universality in the causal principle with the help of the background of the uniformity in nature. But this uniformity of nature, as Mill argues, is a matter of observation. According to him, we have obtained the warranty that nature behaves uniformly because we can observe this feature in nature. Therefore, the very same difficulty arises here because our observation cannot provide us with the apprehension of any necessity. In this connection, we can say that the mechanical application of Mill's methods can at best establish the regularity in the sequence of events but we are not able to discover the causal potency working objectively in the natural phenomena. Now this regularity of one sort or another in a sequence of events play a large part in the epistemological notion of causation or causation as we know it. Consequently, the empiricists in their treatment of causality seem to have laid an emphasis particularly

---

2. Hume : *A Treatise of Human Nature*, p. 162.

on the epistemological notion of causality, while they are forced to deny at the same time the objective aspect of it by saying that there seems to be no such objective causal relation over and above the epistemological one. The rationalists have identified causality with the logical relation between ground or logical premise and consequence while the logical idealists have tied this logical necessity with the metaphysical necessity. But it is obvious that the relation of logical implication can not be identified with the actual causal connection that is operating in the objects in nature. The error, therefore, arises because these philosophers have confused the logical ground with the real cause. Besides, what we can discover in the world system is only the temporal sequence of events, and causality in the metaphysical sense, i.e., the relation as originating in the very nature of a divine substance is not obtainable to us through experience, i.e., on the basis of empirical evidences available to us. In so far as the logical idealist's concept of causation is concerned, these philosophers speak only of the transcendent notion of causality which is divine in nature. If so, such a causality remains outside the reach of the finite human beings, and only an infinite mind can grasp it.

Not only in philosophy but also in modern science the confusion of the epistemological notion of causality and the ontological notion of causality is very much obvious. To put it in other words, the controversy between determinism and indeterminism is based on this kind of confusion. Eddington and his followers generally propound causal indeterminism. They are of the opinion that modern physics does not favour the strict causal relation in the atomic world because it has been found on experiments and measurements that the orbital rotation of infra particles of an atom does not obey a strict causal law. According to them, causality is nothing but only the generalization from our observation of the average behaviour of the atom. But such generalisation is always doubtful because it is based on the regularity in the associate of events. "The common regular association of cause and effect is a matter of experience; the law of causality is an extreme generalisation suggested by this experience. Such generalisations are always risky."<sup>3</sup> Now, the notion of regularity in sequence of events play, as we saw, an important role in the epistemological notion of causality, and, therefore, it involves a kind of causal indeterminism in our experiential

---

3. Eddington : *New Pathways in Science*, p. 74.

world. When Eddington speaks of indeterminism in causality, he is obviously concerned with the evidence-bound or epistemological notion of causality which falls short of the evidence - transcendent causal relation called actual causality. On the other hand, Planck and his followers support determinism in the field of modern physics and argue for the necessary relation in causality. Planck is very much hopeful that it is possible for us to reach the actual causal relation if our methods are accurate. We have already found him saying that the non-fulfilment of the statistical law in a particular case is not due to the fact that the law of causality is not fulfilled, but rather to the fact that our observations are not sufficiently delicate and accurate to put the causality to a direct test in each case. Here Planck seems to confuse the epistemological notion of causality with the transcendent notion of causality. It is because our observations and measurements can help us to know the regularity in sequence of events which is very much an epistemological notion but it does not permit us to go beyond the observational evidences to grasp the actual causal relation which is evidence-transcendent. The sort of controversy which we find in the so-called theories of causality arises because the philosophers as well as the scientists have not been able to arrive at the proper clarifications of the two notions of causality, namely, the epistemological or evidence-bound notion and the ontological notion called evidence - transcendent. We should not forget that we are, after all, finite human beings; how far and however we make our observations and methods accurate there is always the possibility to miss the actual causal relation that is evidence - transcendent or ideal.

## 6.2. The Proposed Solution to the Problem of Causality : The Concept of Causality is still a Working Hypothesis.

The epistemological notion of causality, therefore, warns us about the limit to our human faculty of cognitive activities. The questions are : Is our concept of causality the regularity in sequence of events in the epistemological sense ? or do we have any access to the actual causal relation in the transcendent sense? It is claimed that the actual causal relation is an objective as well as necessary relation among objects in nature, the relation which is the vital aspect of the concept of causality. When we look at the changes among the phenomena in Nature we can very much realize a connection between succession of events that a cause must produce its effect necessarily. In so

far as the cause is necessarily related to its effect, only that effect can be said to arise out of its specific cause. Secondly, any cause cannot produce any effect at random, but only a specific cause can produce a specific effect. For example, the cloth is produced out of threads, and it cannot be produced out of any other cause save the threads. If the effect were not necessarily related to its cause, then any cause would produce any effect whatsoever. But our experience does not allow this position because it is admitted that in our experience we do not see it. This is not at all a generalisation from experience but it follows from the exact nature of the thing and situation. The relation depends on the nature of the thing, and the nature of a thing acts uniformly in the past, present and future, so the causal relation is necessary but not a contingent one. It is neither a feeling nor an expectation which the mind does when it encounters the phenomena in the external world. It does not come into being along our observation of the phenomena. Venn in his *Principles of Empirical or Inductive Logic* (pp. 131-132) contends that there is certainly the Humean sort of difficulty in cognizing the objective causal connection among the phenomena. But he is not of the opinion that this difficulty does not admit of any logical solution. When we say that a wave striking a boat causes it to move we imply that a necessary relation exists between the cause and the effect. We feel that this relation is not our feeling or imaginative construction which we have imposed on the external phenomena, e.g., wave's striking a boat causes its movement. We can very well realize that there is obviously a necessary relation between the striking of the wave and the movement of the boat. It is felt because it is real, not real because it is felt. Venn here argues that we feel the presence of the necessary relation but we cannot go to assert the universal validity of it only for the reason that we cannot go beyond the limits of our understanding. Similarly when Bacon fails to single out the actual cause and goes to appeal to intellect, Kneale observes that even our intellect is not able to help us to find out it. But Venn says that though we cannot go beyond the capacity of our intellect and prove the necessary relation between cause and effect, it would be wholly irrational on our part to conclude decidedly that there is no such relation. The inevitable outcome of this position is that we cannot go logically beyond the realm of the understanding on the one hand and that of our observational grounds and evidences on the other to know the ontological causation; we must, therefore, be confined strictly to the evidence-bound notion of causality. And it is this notion of causality that is, in fact, sustained by the regularity in sequence of events.

But what notion of causality should we then opt for? What all we need to say in the light of the foregoing discussion is that we should favour opting for the epistemological notion or the weak notion of causality. In so doing, we are now going in some sense to support a particular philosophy which is called soft realism. In the field of contemporary philosophy, it goes under the title 'Internal Realism'. It is basically motivated to blend realism with that which is totally evidence-bound, that is, with that which we cognize on the basis of available evidences. Now, if we, like Kant, assume that there is a real external world or noumenal world on the one hand and the phenomenal world on the other, then the real external world is independent of our perceptions and measurements. In this case, we cannot say that there is a strict causation operating in this world because the limitations of our knowing faculty of perceptions and investigations do not allow us to know or assert. In other words, we know nothing of this world which lies beyond our human perceptions and observations and, therefore, can make no claim of either determinism or indeterminism in causality. On the other hand, if we believe that our perceptions, observations and scientific measurements are the only ultimate materials for the construction of the order of nature or if we agree with the positivists that science is concerned only with these materials, then the inevitable outcome of this position is that our concept of causality is only the weak notion or evidence-bound causality. Consequently, in such a world as *it is known to us* indeterminism or contingency exists, and what we, therefore, experience is only the regularity in sequence of events. Now, if in a world in which events take place in accordance with the causal laws which we come to acquire on the basis of regularity, then such laws of causal relation are not only reasonable but also useful, and, therefore, to be regarded as only working hypothesis. James Murphy in his Introduction to Planck's book *Where Is Science Going?* (pp. 131, 32) says that the Principle of Indeterminacy is in reality an alternative working hypothesis which takes the place of strict causal law. Russell also holds that causality is only a working hypothesis which has the possibility to be ruled out by subsequent observation. According to him, the so-called notion of 'strict universality' in causality is after all, an 'ideal' notion, and there is no available evidence by which this can be established as certain. Rather we establish the relation between cause and effect on the basis of observation. We repeatedly observe that two events are coming one after another, and experience the uniformity of this sequence. On the basis of the experience of this regularity in such a sequence, we make an inductive generalisation that 'A is the

cause of B'. Russell, like Hume, holds that from the experience of the uniformity of cause and effect we expect that something will happen on future occasions too. But what is most important to note here is that the inductive generalisation which is the foundation of causal law is based on incompletely known regularities in the sequence of events, and probably the true causality is yet to be discovered in such a particular case. Hence, all that we can say here is that the causal law is only an approximate generalisation but not absolute, and, therefore, this causal law may be found incorrect in future too. Since the inductive principle is probable, the causal law that is based on such reasoning is equally probable. Russell is of the opinion that when the relation between cause and effect fails to hold, we try to find out the more constant relation under which the events fall. Thus causation is not a connection between events; it is merely the uniformity of sequence that we experience. According to Russell, we observe that all A's are B's and assume thereby that in the next time the case of A will be the case of B. As we have no other reasonable ground for our belief that what happens now will also happen in future, so this is to be accepted as merely an assumption which is only probable. But it is also useful to us because it is sufficient for our rational expectation and practical guidance. If we understand causality in the sense in which Russell explains it, then this notion of causality is merely a working hypothesis and nothing else. Therefore, the rationalist's concept of causal relation as necessarily universal or a priori is false and has, therefore, no application in science, for causal law in this field is only a functional relation between events where one follows another. Science aims at establishing its laws on the basis of collecting data about the relevant issue. When the scientists go deeply into the problem of the atom, they find themselves puzzled because strict causality is not found in the sub atomic processes. Here the scientists observe the uniformity in the average behaviour of the atomic particles and formulate causal laws on the basis of the experience of this uniformity in sequence of such behaviour. Now these laws are hypothesis which have the possibility to be overthrown in future by subsequent observations. Therefore, all hypotheses are only tentative truths. Hence, Russell holds that there is a weak form of postulate, viz., the postulate of causality which is working as the foundation of all scientific hypotheses. He says, "This postulate, in a suitable form, can make scientific laws probable but without it they do not even achieve probability."<sup>4</sup> As epistemic agents we can at best postulate the causality to explain the worldly

---

4. Russell : *Human Knowledge : Its Scope and Limits*, p.329.



phenomena, and a particular causal law is true in so far as it works, i.e., it does not fail. If it fails, then we should gather further instances to strengthen the law of causality. In this sense, causal laws are to be accepted as working hypotheses. Thus, we are being led to admit the validity of the acceptability claim of the causality which is no other than the evidence-bound or epistemological notion of causality. On the other hand, it seems impossible for the finite epistemic agents like human beings to grasp the ontological causality, if any, at the background of the worldly phenomena, and hence it remains as a transcendent notion or ideal. Therefore, we should not hesitate to conclude that the *causality itself* goes beyond our human discovery, and therefore causality itself must be delinked from the *causality as we know it*.

## BIBLIOGRAPHY

### Books

1. Alexander, S. : Space, Time, And Deity, Vol. I, Macmillan & Co, Ltd., London, 1966.
2. Ayer, A.J. : Probability And Evidence, Macmillan Press Ltd., London, 1972.
3. Ayer, A.J. : Metaphysics And Commonsense, Macmillan & Co, Ltd., London, 1969.
4. Bambrough, R. (ed.) New Essays On Plato And Aristotle, Routledge & Kegan Paul, London, 1965.
5. Bhattacharya, B. K. : Causality in Science and Philosophy, Sanskrit Pustak Bhandar, Calcutta, 1969.
6. Bosanquet, B. : The Essentials of Logic, Macmillan & Co, Ltd., London, 1928.
7. Bosnquet, B. : Logic or Morphology of Knowledge, Vol. II, Humphrey Milford, O.U.P., London, 1931.
8. Bradley, F. H. : Appearance and Reality, Oxford University Press, Oxford, 1959.
9. Connor, D.J.O. (ed.) A Critical History of Western Philosophy, The Free Press of Glencoe, London, 1964.
10. Copleston, F. : A History Of Philosophy, Vol. IV, Burns & Oates Ltd., London, 1965.
11. Cottingham, J. (ed.) Descartes, Cambridge University Press, Cambridge, 1996.

12. Crombie, I. M. : An Examination of Plato's Doctrines, Routledge & Kegan Paul, New York, 1966.
13. Dingle, H. : Through Science to Philosophy, The Clarendon Press, Oxford, 1937.
14. Ducasse, C. J. : Truth, Knowledge and Causation, Routledge & Kegan Paul, London, 1968.
15. Ducasse, C. J. : Causation and The Types of Necessity, Dover Publications, New York, 1969.
16. Eddington, A. : New pathways in Science, Cambridge University Press, Cambridge, 1935.
17. Eddington, A. : The Nature of the Physical World, J.M.Dent & Sons Ltd., London, 1955.
18. Emmet, D. : Whitehead's Philosophy of Organism, 2<sup>nd</sup> ed., Macmillan & Co., London, 1966.
19. Ewing, A.C. : Kant's Treatment of Causality, London, 1924.
20. Findlay, J. N. : Hegel : A Re-Examination, George Allen & Unwin Ltd., London, 1964.
21. Gulley, N. : The Philosophy of Socrates, Macmillan & Co. Ltd., London, 1968.
22. Guthrie, W.K.C. : The Greek Philosophers, Methuen & Co. Ltd., London, 1967.
23. Haldane, E.S. & G.R.T.Ross : Meditation III, Vol.I, New York, 1955.
24. Hampshire, S. : Spinoza, Penguin Books, Harmondsworth, 1951.
25. Harris, E. : Foundations of Metaphysics in Science, George Allen & Unwin Ltd., London, 1965.

26. Hume, D. : *Treatise of Human nature*, ed. by L.A.Selby – Biggs, Oxford University Press, London, 1965.
27. Jeans, J. : *Physics and Philosophy*, Cambridge University Press, London, 1943.
28. Joachim, H.H. : *A Study of the Ethics of Spinoza*, Oxford, 1901.
29. Jevons, W.S. : *The Principle of Science*, Dover Publications, New York, 1958.
30. Johnson, W.E. : *Logic, Part III*, Dover Publications, Inc., New York, 1964.
31. Keeling, S.V. : *Descartes*, 2<sup>nd</sup> ed, Vol. I, Oxford University Press, London, 1968.
32. Kneale, W. : *Probability and Induction*, Clarendon Press, Oxford, 1949.
33. Locke, J. : *Essay Concerning Human Understanding*, Book II, Chapter XXI, ed. by A.S.Pringle – Pattison, Oxford University Press, London, 1964.
34. Loclere, I. : *The Relevance of Whitehead*, George Allen & Unwin Ltd., London, 1961.
35. mackie, J.L. : *The Cement of the Universe*, The Clarendon Press, Oxford, 1986.
36. Magill, F.N. : *Masterpieces of World Philosophy*, George Allen & Unwin Ltd., London, 1968.
37. Mill, J.S. : *System of Logic*, Longmans, Green & Co, Ltd., London, 1965.
38. Pap, A. : *Introduction to the Philosophy of Science*, The Free Press, New York, 1967.
39. Paton, H. J. : *Kant's Metaphysics of Experience*, Vol. II, George Allen & Unwin Ltd., London, 1965.

40. Patrick, G.T.W. : Introduction to Philosophy, George Allen & Unwin Ltd., London, 1968.
41. Philip , F. : Philosophy of Science, Englewood Cliffs, Prentice Hall, 1957.
42. Planck, M. : Where Is Science Going ?, Allen & Unwin, London, 1933.
43. Popper, K : The Logic of Scientific Discovery, Hutchinson and Co., Ltd., London, 1959.
44. Popper, K. : Conjectures and Refutations, Routledge & Kegan Paul, London, 1963.
45. Popper, K. : Objective Knowledge, Oxford University Press, Oxford, 1979.
46. Rescher, N. : The Philosophy of Leibniz, Englewood Cliffs, Prentice-Hall, Inc., New Jersey, 1967.
47. Ross, D. Aristotle, University paperbacks, Methuen, London, 1964.
48. Roth, L. : Spinoza, George Allen & Unwin Ltd., London, 1954.
49. Russell, B. : A Critical Examination Of The Philosophy Of Leibniz, George Allen & Unwin Ltd., London, 1951.
50. Russell, B. : Our Knowledge of the External World, New American Library, New York, 1960.
51. Russell, B. : Human Knowledge, Its Scope and Limit, A Touchstone Book, Published by Simon And Schuster, 1976.
52. Sarkar, T.K. : Knowledge, Truth and Justification , Allied Publishers Ltd., Calcutta, 1992.
53. Sayre, K.M. : Plato's Analytic Method, University of Chicago Press, Chicago, 1969.
54. Smith, N. K. : Studies in the Cartesian Philosophy, London, 1953.

55. Smith, N.K. : *New Studies In the Philosophy of Descartes*, Macmillan & Co, Ltd., London, 1963.
56. Smith, N. K(Trans.). : *Immanuel Kant's Critique of Pure Reason*, The Macmillan Press Ltd., London, 1978.
57. Stace, W.T. : *A Critical History of Greek Philosophy*, St. Martin's Press, New York, 1967.
58. Stebbing, L. S. : *Philosophy And The Physicists*, Dover Publications, Inc., New York, 1958.
59. Strawson, P.F. : *The Bounds of Sense*, Methuen & Co, Ltd., London, 1966.
60. Venn, J. : *The Principles of Empirical or Inductive Logic*, Macmillan, London, 1907.
61. Venn, J. : *Logic or Chance*, 4<sup>th</sup> ed., Chelsea Publ. Co., New York, 1962.
62. Vlastos, G. : *Platonic Studies*, Princeton University Press, Princeton, 1973.
63. Warrington, J. (ed. & Trans.) : *Aristotle's Metaphysics*, Everyman's Library, London, 1966.
64. Whitehead, A.N. : *Symbolism, its meaning and effort*, Cambridge University Press, Cambridge, 1958.
65. Whitehead, A. N. : *Process and Reality*, Free Press, New York, 1969.
66. Wilson, M.D. : *Descartes*, Routledge & Kegan Paul, London, 1978.
67. Zeller, E. : *Outlines of the History of Greek Philosophy*, Routledge & Kegan Paul, London, 1963.

## Articles

1. Anscombe, G.E.M. : "Causality and Extensionality" in *Journal of Philosophy*, IXVI (1969)
2. Bobro, M. & Clatterbaugh, K. : "Unpacking the Monad : Leibniz's Theory Of Causality" in *The Monist*, Vol. XXXXXXIX, No.3 (1996), 408-425.
3. Daveney, T.F. : "Intentions and Causes" in *Analysis*, XXVII (1966-7), 23.
4. Davidson, D. : "Causal Relations" in *Journal of Philosophy*, IXIV (1967), 691-703.
5. Dummett, M. : "Can an Effect Precede its Cause ?" in *Proceedings of the Aristotelian Society*, XXVIII (1954), 27-44.
6. Flew, A. : "Can an Effect Precede its Cause?" in *Proceedings of the Aristotelian Society*, XXVIII (1954), 45-62.
7. Flew, A. : "Effects before their Causes?" in *Analysis*, XVI (1955-6), 104-10.
8. Flew, A. : "Causal Disorder Again" in *Analysis* XVI (1956-7), 81-6.
9. Gale, R.M. : "Why a Cause Cannot be Later than its Effect", in *Review of Metaphysics*, XIX (1965), 209-34.
10. Lyon, A. : "Causality " in *British Journal for the Philosophy of Science*, XVIII (1967), 1-20.
11. Mackie, J. L. : "Causes and Conditions" in *American Philosophical Quarterly*, ii (1965), 245-64.
12. Mackie, J. L. : "The Direction of Causation" in *Philosophical Review*, IXXV (1966), 441-66.
13. Pears, D. F. : "The Priority of Causes" in *Analysis*, XVII (1956-7), 54-63.

14. Schmitt, A.M. : "Formal Causation And The Explanation Of Intentionality In Descartes", in *The Monist*, Vol. XXXXXXIX, No.3 (1996), 368-387,
15. Sprigge, T.L.S. : "Final Causes" in *Proceedings of the Aristotelian Society*, XIV (1971), 149-70.
16. Taylor, C. : "Teleological Explanation – Reply to Denis Noble" in *Analysis*, XXVII (1966-7), 141-3.
17. Vendler, Z. : "Causal Relations" in *Journal of Philosophy*, IXIV (1967), 704-13.

UNIVERSITY OF  
LIBRARY  
OF