UNIT: 6: CAUSE: NECESSARY CONNECTION AND CONSTANT CONJUNCTION

UNIT STRUCTURE

6.1. Learning objectives

6.2. Introduction

6.3. Definition and meaning of cause

6.3.1. Aristotle view about cause

6.3.2. David Hume's view about cause

6.3.3 John Stuart's Mill's analysis of cause

6.3.4. Francis Bacon's views on causal relation

6.4. Cause and necessary connection

6.5. Constant conjunction

6.6. Let us sum up

6.7. Further readings

6.8. Answers to check your progress

6.9. Model questions

6.1. LEARNING OBJECTIVES:

After going through this unit you will be able to

- Define the meaning of cause
- Differentiate different philosophical views on causal relations
- Explain the concepts of necessary connection and constant conjunction
- Analyze cause in terms of necessary connection
- Explain the view of Causality in Terms of Constant Conjunction

6.2. INTRODUCTION:

Common people believe that a cause is a power or force which produces the effect. Physical science improves upon this popular view and interprets causality in the light of the doctrine of conservation of energy. By conservation of energy we mean that the total amount of energy in the universe is constant, that it is neither increased nor decreased but that it

undergoes modification in different forms.

The word 'cause' has been used in different senses. Popularly speaking cause is the agent which actively produces the effect. It exerts a power and makes the event occur. Locke takes cause in the sense of a "power". We displace things in the environment. We have direct experience of being active when in volition we exert effort to do something.

'Cause' is a relative term the co-relative of which is 'effect'. The concept of 'cause' has occupied a significant place in the empirical sciences. Here inductive reasoning is known as applied causality where the law of causation plays a significant role as a fundamental concept and a principle of their method. Through the law of causation we can relate some processes to some other processes in our ordinary experience. This type of law of causation cannot be applied to those events or cases that are unrelated and independent to each other. To ascribe causal relation is a basic ability of a person to perceive, understand and differentiate between the various kinds of relations between events and processes and make judgments about them. By making such kinds of judgements one can make one's actions adaptive to the surroundings. The concept of causality is analyzed, clarified and defined only in the context of logic, epistemology, metaphysics and philosophy of science. However, to analyze the meaning of the term 'causality' is somewhat problematic which is mixed up with some serious and controversial philosophical issues.

6.3. DEFINITION AND MEANING OF CAUSE:

Ordinarily, the term 'cause' is used in the sense of reasons why something happens. Speaking about the cause of some happenings involves some explanation which relates itself to some other occurrences that makes it intelligible why it happens. The cause of an effect is the totality of those things or circumstances the presence of which has made the effect happen and also the absence of which makes the effect would not have happened. Again, the term 'cause' implies different characters or qualities depending

upon its different context. In some cases, it signifies necessary condition of an effect, which in some others it signifies sufficient condition. But, in spite of these, there are some cases where the cause is neither a sufficient nor a necessary condition of the effect. In such cases, it may be a contributory condition of the effect. Hence, logicians as well as the philosophers are trying to analyze and define the concept of causality from their own viewpoints and have tried to offer a sufficient explanation of the concept of cause.



LET US KNOW

'Cause' is a relative term the co-relative of which is 'effect'.



CHECK YOUR PROGRESS

Q 1: How does causal relations guide our actions in everyday life?

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Q 2: State three different uses of the word "cause".

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6.3.1. Aristotle's View About Cause:

Aristotle's account of causality is one of his best known theories. It is central to his whole philosophy and has been hugely influential in the history of Western thought. In essence, Aristotle holds that a complete account of anything will answer four kinds of question. Or, to put it another way, when we ask a "why?" question about something, there are four kinds of answer. For this reason, Aristotle's "four causes" have sometimes has

been called the "four becauses".

The four causes have traditionally been labeled.

- Material
- Formal
- Efficient
- Final

Material cause

Why is a book flammable? Because it is made of paper. Why does a bullet sink? Because it is made of lead. Often, the reason something has a certain property is simply that it is composed of a certain material. In such cases we explain the property in question by referring to its "material cause".

Formal cause

Why is something a chair rather than a stool? Because it has a back as a well as a seat. Why is an animal a fish rather than a bird? Because of its bodily configuration, with scales, fins, and gills rather than wings, legs, and a beak. In these cases we refer to the form of the things to explain why they are one sort of thing rather than another.

Efficient cause

Why or how did this chair come to exist? A carpenter made it. Why does this oak tree exist? It grew from an acorn. Here we answer the question by identifying the person, thing, event, or force that brings something about or causes something to exist.

Final cause

Why do we have eyes? The answer is in order to see. Why does my watch exist or in other words, why was it made? The answer is for the

purpose of telling the time. A thing's "final cause" is the purpose or function it serves- its reason for being.

The examples given above are of simple material things. But Aristotle's analysis can be extended to all sorts of things. Here are two other examples:

A poem

Material cause-words

Formal cause-sonnet (or limerick, haiku, etc.)

Efficient cause-the poet

Final cause-to give pleasure (expresses feelings, impress a lover, etc.)

A river

Material cause-water

Formal cause-winding and flowing (as opposed, for instance, to a lake)

Efficient cause-rain and weathering processes

Final cause-to provide a habitat for fish, and water for animals

Identifying a final cause for a river raises an interesting and important issue. Today, when we talk about the "cause" of something, we invariably mean its "efficient cause." And while we are happy to talk about the purpose or "final cause" of artifacts like watches or shoes, things that people have deliberately designed and manufactured, we are skeptical about the ides that there are purposes in nature. Darwin's theory of evolution shows how it can happen that the appearance of purpose in nature can be brought about by a blind process, without there being any designer.

Aristotle's philosophy, however, is "teleological" through and through. (The term "teleological" is derived from the Greek word "telos" which means "end," "function," or "purpose.") He was firmly convinced that there are purposes in nature. In his view, it makes sense to ask about the final cause of anything, whether it is natural or artificial. And that includes human beings.



LET US KNOW

According to Aristotle, there are four kinds of causes i.e.; material, formal, efficient and final.



ACTIVITY: 6.1

Q1: How is Aristotle's four kinds of causes related to each other? Discuss.

Ans: .....

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6.3.2. David Hume's View about Cause

According to David Hume, inductive reasoning from observed instances to the unobserved is based on causal relation. The idea or notion of causation is a complex notion about the relation between events. Hume maintained that causation itself is a matter of constant conjunction. He was of the view that whenever one event causes another, there is a causal law which relates different types of events in a causal connection where the two particular events are instances. This has led to a theory of causal explanation, according to which one causally explains some event if one shows how the sentence asserting its occurrences is a deductive consequence of a general causal law and a statement of the occurrence of its cause. According to Hume, there are three components in the notion of causation-priority, contiguity and necessary connection. Priority means the cause has to occur prior and not after the effect. Contiguity means the cause and effect have to

be adjacent to each other. Necessary connection means that the cause and effect must be necessarily connected in such a way that the cause actually produces the effect or makes the effect happen. In other words, cause necessitates the effect in this sense. Hence, Hume summarizes that there is a necessary connection between cause and effect.

However, Hume himself has maintained that though the relation between priority and contiguity could be justified yet the relation between production and necessary connection cannot be justified by any evidence. He said that this necessary connection cannot be found in actual cases. For example, when a person flips the light switch, the light goes on and if he flips it again it goes off. Here, though it is thought that there is a causal connection between flipping the switch A and the light going on B, the fact is that in this case A is followed by B. Here, no necessary connection between the cause and its effects can be seen. Any attempt to observe this necessary connection would lead only to the fact that one event is followed by another. Nor any empirical method can establish any necessary connection between the concepts of cause and effect. Any such attempt to establish such necessary connection between cause and effect with the help of some empirical methods again presupposes the two underlying principles of cause and effect i.e.; the principles of causation according to which every event has a cause and the principle of causality according to which like causes have like effects.

So, when anyone is looking around for necessary connection, he does not find anything in addition to priority and contiguity. Along with priority and contiguity there is another relation i.e.; the constant conjunction of resembling instances. People discover that the thing known as cause is always followed by the thing effect. This constant repetition or the constant conjunction of resembling instances in human experience gives rise to a certain expectation in human mind whereby anyone perceive any cause, he automatically expect to perceive the effect. It is this 'felt determination of mind' to pass from the perception of the causes to the lively expectations of the effect and from the idea of the cause to the idea of the effect which

gives the illusion that there is something in nature in addition to priority, contiguity and constant conjunction. This something is nothing but the conviction that there is necessary connection in nature which is none other than an illusion. The only reality is the reality of priority, contiguity and constant conjunction. So, from these points of view, there can be no necessary causal connection between causes and its effects.



LET US KNOW

According to David Hume causation itself is a matter of constant conjunction.

6.3.3 John Stuart's Mill's Analysis of Cause

John Stuart Mill is one of the inductive logicians of modern age. John Stuart Mill tried to analyze the concept of cause in order to formulate the canons for the methods to discover causal relations amongst events. In his book 'A System of Logic' Mill elaborates the Law of Causation and the concept of Causality. He explains causality with special reference to the relations between physical phenomena. He keeps aside any metaphysical notion of causality from considerations. For him, the relation of succession among events is most important and there is one law which sustains the uniformity of succession indefeasibly. This law is known as the law of causation which in view of Mill holds in the entire sphere of human experience of successive events.

Mill has mentioned certain characteristics about the concept of cause. In fact, Mill's characterization of cause is derived from the analysis of causality provided by David Hume. Also, Mill's method of discovery of causal relation or proof of any causal relation is developed from tabular methods of scientific discovery of Francis Bacon. Mill agrees with Hume's contention that cause is the invariable antecedent of the effect. Mill disagrees with Hume's rejection of necessary connection between cause and effect.

According to Mill's characterization of cause, causal relation holds between successive events. Cause is the earlier or antecedent event in time while the effect is the later or consequent event. If C is the cause of E, then E cannot be prior to or simultaneous with C. This order is irreversible provided that cause changes into effect at a speed slower than that of light. Otherwise an observer may perceive effect earlier than the cause. Modern theories in physics about the structure of the universe permit cause from the future producing effect in the past. From our ordinary way of thinking it appears to be strange and paradoxical.

The succession of events may be either variable or invariable. The cause of any event is the invariable antecedent of the effect. Whatever earlier event is variable is not related to the latter by causal relation. For example, if C is the cause of E, then for every X, if this X is an instance of E, X is preceded by any Y; Y is an instance of C.

Again, cause is the unconditional antecedent of the effect. If D is followed by F depending on some condition K, then D is not invariable antecedent because in absence of the condition K being fulfilled it will not be followed by D. In this way, if C is the cause of E, then for every X, if X is an instance of E; X is preceded by any Y, Y is an instance of C and it is not the case that for all Z, X is preceded by Z and Z is not part of Y and there is an Y which is not accompanied by Z and is not followed by an X. So, it can be maintained that C is cause of $E \equiv (X)(Y)(Z)\{X \in E \equiv$ (X is preceded by Y and $Y \equiv C$)and (X is not preceded by Z, Z is not part of Y and, Y being not accompanied by Z is not followed by X)}. To ascertain the unconditional character of the invariable antecedent i.e.; the cause is the most significant exercise for the scientists in their investigation. The cause is the unconditional prior happening because it is inclusive of all the conditions that have to be invariably present in order that effect comes into existence. Apart from the cause there is no other condition to be fulfilled in order that the effect occurs. Cause is also the immediate antecedent of the effect. Immediacy is implied by unconditionality. If some invariable antecedents fail to bring about the effect immediately but after some duration of time bring in the effect, then

obviously during the time of interval some other required conditions have been fulfilled, i.e.; some changes in the circumstances have taken place which had made the situation adequate to bring in the effect.

Cause and effect can be characterized quantitatively. The law of conservation and energy implies that the quantity of matter and energy in the cause is equivalent to the quantity of matter and energy in the effect. The quantity of matter and energy in the universe is always the same but they change from one form to another. Matter and energy are never created nor destroyed. Therefore, Carveth Read stated: "The cause of any event, then, when exactly ascertainable, has five marks: it is (quantitatively) equal to the effect, and is (qualitatively) its immediate, unconditional, invariable antecedent."



CHECK YOUR PROGRESS

Q 3: According to Hume, the complex notions of causality can be analyzed into simpler notions. Now what are those simpler notions?

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Q 4: Is empirical justification of necessary connection possible?

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Q 5: What is the quantitative relation between cause and effect?

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ACTIVITY: 6.2

Q2: How does Hume elaborate the notion of causality?

Ans: .....

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6.3.4. Francis Bacon's Viees on Causal Relation

Francis Bacon is the earliest philosopher of the modern age to develop theories on scientific method and inductive logic in the book Novum Organum. According to Bacon in scientific investigation the laws that we are going to discover are the laws of connection between generating and generated nature. Here, 'nature' means the 'events that recur' or 'phenomenon that has many instances'. In Bacon's terminology, 'generating nature' is the cause while the 'generated nature' is the effect. A generating nature or cause of an event is co-present, co-absent and co-variant in degree with its corresponding generated nature or effect. Bacon assumed that all the complicated happenings or events in this world are because of the co-ordination of limited nature or causes. This point can be discovered after analyzing the co-presence, co-absence and co-variation of the generating and generated nature. For doing this Bacon developed a tabular method. Bacon also uses the term 'form' to denote cause, but it is not to be identified Aristotle's formal cause. Bacon form is observable and could be found by careful examination of tables of presence, absence and co-variation.

The tabular method of Bacon consists of procedures for isolating and further investigating the form nature, or cause, of phenomenon, including the method of agreement, method of difference, and method of concomitant variation. Bacon suggests that we should draw up a list of all things in which

the phenomenon we are trying to explain occurs, as well as a list of things in which it does not occur. Then we rank our lists according to the degree in which the phenomenon occurs in each one. Then we should be able to deduce what factors match the occurrence of the phenomenon in one list and don't occur in the other list, and also what factors change in accordance with the way the data had been ranked. Thus, if an army is successful when commanded by Essex and not successful when not commanded by Essex, and when it is more or less successful according to the degree of involvement of Essex as its commander, then it is scientifically reasonable to say that being commanded by Essex is causally related to the army's success. From this Bacon suggests that the underlying cause of the phenomenon, what he calls the "form," can be approximated by interpreting the results of one's observations. This approximation Bacon calls the "First Vintage." It is not a final conclusion about the formal cause of the phenomenon but merely a hypothesis. It is only the first stage in the attempt to find the form and it must be scrutinized and compared to other hypotheses. In this manner, the truth of natural philosophy is approached "by gradual degrees," as stated in his Novum Organum.

6.4. CAUSE AND NECESSARY CONNECTION

A cause is typically defined as 'a person or thing that produces an effect', whereas an effect is defined as 'a change which is a result of an action or other cause.' Also a necessary connection is defined as that which needs to be present between two or more things necessarily. The necessary connection of an effect is that condition in absence of which effect doesn't occur. A necessary connection must be present in order that the effect comes into existence. Its precedence is absolutely required for the effect. If the effect is present then its necessary conditions must have been present earlier. It can never be the case that the effect has occurred but any of its necessary condition was not fulfilled before. But the presence of any necessary condition does not guarantee that effect must follow. If some necessary conditions are present while some others are absent, then effect will not

emerge. However if all the necessary connections are fulfilled then effect is bound to take shape.

The connection between cause and effect is often cited as being necessary by laymen, philosophers and scientists. To say that there is no necessary connection between cause and effect seems to be opposite of our experiences of reality. For example, the Greek philosopher Plato argued in his Timaeus thatthe world is built with order and regularity. There is a necessity here because of what has to be, thus causality could be explained via necessity and mathematics. While Aristotle in his Physics and Metaphysicssays that no events are causeless, while admitting that not all events can have their causes found, because not every event has the sort of regularity which science requires in finding causes. Corresponding with Plato's and Aristotle's view of causality and its necessary connection, the philosopher Bertrand Russell put forward his views in his essay On the notion of cause, with applications to the free-will problem. In this essay he says that causality is a relic of bygone ages and Science leads the way forward out of this philosophical minefield. But how it does this is not exactly made clear, other than induction and experience.

However, neither Plato, nor Aristotle or Russell was concerned with the question whether there is any kind of necessary connection between cause and effect. Instead they assumed this kind of connection between the two by assumed necessity or empirical suggestion. But in contrast to them after long time back it David Hume believed that when one experiences a cause and an effect there is no necessary connection which is observable, we merely form the idea by experience. So if one wants to experience the same effect after the same cause, and then we would assume that cause and effect have a necessary connection. The problem with this, as Hume points out: is that this doesn't prove anything. When we form the concept of necessary connection between cause and effect we are assuming the universe works in a regular way and that our experiences are reliable.

If we follow Hume then we can see the necessary connection between cause and effect in a new light. According to Hume if A causes B, therefore B has always been seen to follow A. Thus, B will always follow. This implies that nature is uniform, and there is never enough evidence for that conclusion because it is a matter of fact. It cannot be justified by logic, since there is no contradiction in saying that A does not cause B and so on. Also it cannot be proved from experience, but merely suggested, because we cannot witness every event to ever say that logically there is a connection between cause and effect. They seem to be conjoined, but never connected. Regularity fails to reveal any necessity in causation, and also fails to reveal any necessity between cause and effect. Our inductive method is flawed, and we form a notion of causality by induction. The inductive method is flawed as it relies on itself to prove itself practically, but cannot logically.

For Kant the necessary connection between cause and effect was a human intuition given to us by experience of reality. In this sense causality is objective, while our experience of it is synthetic. Thus, causality is an a priori notion, but is only known a posteriori (experience) which means that causality is a synthetic fact which stems from an a priori fact combined with the experience of cause and effect. So, for Kant cause and effect does have an objective necessary connection.

If causality is a human intuition placed on reality to make sense of it, and thus translates reality into a human experience: could the causal laws and laws of nature commonly known as physics which could merely be reduced to a human intuition and translation of reality so one can understand it? If this is possible then this would reduce causality and the necessary connection between cause and effect to a human matter of fact; an improvable concept, which is only ever suggested by experience, but never proved. It again leaves it open for the future to disprove it by failing to proceed in a regular pattern which fits our idea of causality. Or would this merely reflect our ignorance of this universe and how it works? Such types of problems were present in Kant's formulation and so Kant's attempt to examine necessary connection between cause and effect also meets failure.

Hence, we have no logical foundation for thinking that cause and effect have a necessary connection. Theoretically cause and effect have no proved necessary connection. However, practically it does have a connection, although not necessary i.e.; via induction from experience. This is theoretically flawed and contains no certainties. In this sense Hume was correct in his criticisms of cause and effect, and its necessary connection. While Kant made a respectable effort to try and find a practical proof to further legitimize the necessary connection. Although this failed, it was a respectable attempt and pursuit: one that was also an endeavor to legitimize Science not by theoretical foundations in logic, but by practical application of experience and the assumption of regularity which Kant believed stemmed from an a priori knowledge of concepts. Which were then proved via experience resulting in synthetic knowledge based on the objective and necessary. Thus if successful would give Science a metaphysical foundation making it a legitimate system both theoretically and practically. However, Kant is unable to make its theoretical foundation solid, but does leave us with a practical application of cause and effect and its concept although, this still leaves the necessary connection of cause and effect as a redundant feature of the concept of causality. This is to say that may be there is a necessary connection between a cause and its effects, but this necessary connection can be practically applied at this time for it lacks the logical proof to become a legitimate feature of cause and effect. As Hume mhimself had made clear that to try to prove cause and effect's necessary connection with a methodology which again requires as well as relies on cause and effect to function is somewhat absurd.



LET US KNOW

A necessary connection is that where the effect follows the cause necessarily



CHECK YOUR PROGRESS

Q 6: What do you mean by a necessary connection?

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Q 7: What was Plato and Aristotle's view about cause and necessary connection?

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Q 8: What was Kant's view about necessary connection?

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Q 9: How did Hume analyzed the concept of necessary connection?

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ACTIVITY: 6.3

Q3: What is the relation between the notion of cause and necessary connection?

Ans: .....

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6.5. CONSTANT CONJUNCTION

According to David Hume the relation between cause and effect has only the characteristics of succession and contiguity. The third characteristic of necessary connection and production is ordinarily supposed to be another essential aspect of causality. However, according to Hume, this supposition when examined proves to be incapable of any rational justification. If we analyze two similar classes of events one designed to be the cause of the other what do we find in their relation? According to Hume we search our experience, i.e.; sense impressions relating events which are called cause and events we find three things in them:

(a) Relation of succession: The class of events called Cause is experienced to be followed by the class of the events called effect. For instance, fire causes heat and smoke. All cases of fire are followed by cases of heat and smoke. Thus, causes are antecedent events and effects are consequent events. This is supported by evidence as we have impressions of fire followed by impressions of heat and smoke. But of any two classes of events the instance of one of which are followed by instances of the other is not regarded to be the cause.

(b) Relation of contiguity: Instances of two kinds of events related by causal relation are experienced to be contiguous. Cause is prior to effect while effect is posterior in temporal relation as experience shows us. A prior event in the remote past is not regarded to be the cause of some other event happening now. Cause and effect are experienced as antecedent to be immediately followed by the consequent. If fire is experienced the moment before, smoke and heat are to be experienced in the next moment. It is not the case that fire is experienced now and heat and smoke will be experienced tomorrow.

(c) Constant conjunction: It is ordinarily believed that cause and effect are not a simple relation of a sort where events of one kind are followed by events of another. If one instance of a definite kind is experienced to be

followed by another instance of some other definite kind and even if it is experienced to be so on many occasions, the relation between two kinds of events may be co-incidence but not of causation. Therefore, it is believed that what is peculiar to causal connection is a necessary connection. Cause must produce the effect. What does this characterization of production or production or effectuation and searched for the ground of such sort of relation.

Hume considers whether this necessary causal connection could be a logical relation known as a priori. He does not accept any a priori demonstration to the effect that causality is a necessary connection. We can think of the antecedent event being followed by the consequent event without having any relation between the two. We experience that the two are distinct one being followed by the other and we don't perceive any other element called connection. It involves no contradiction to think that instances of fire being followed by instances of smoke without there being any connection between the two.

If the necessity of causal relation is a logical relation then it will involve contradiction to think of any two classes of events supposed to be having a causal relation that the antecedent event occurs but the consequent does not follow. But it does not involve any contradiction to think in this manner in any case of causal relation. For example, we may imagine without any contradiction that fire occurs but no heat generated from it. Thus, the necessary connection which is supposed to be required in addition to succession and contiguity for a causal relation ultimately turns out to be a relation of constant conjunction. Thus, in our experience, if a large number of instances of events of one and same kind are immediately followed by events of another kind, we expect the consequent events whenever we experience the antecedent event. For example, all our past experiences of fire are followed by instances of smoke. Therefore, we believe that any future instances of fire will be followed by smokes or fire or smokes are necessarily connected.

How does constant conjunction lead to causal relation? Constant conjunction leads to causal relation by virtue of psychological laws of association. We are determined by our natural propensity to attribute causal relation to events that are constantly conjoined in our experience. The justification of an inductive reasoning that establishes causal relation between premises and conclusion does not depend on the relation between premises and conclusion but it depends on the psychological laws of association which connect constantly conjoined experiences with a causal link. We read causality in natural happening because of our nature; apart from these laws of association causality is not in the things and events themselves.



CHECK YOUR PROGRESS

Q 10: What are the three types of characteristics that the relation between cause and effect has?

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Q 11: What do you mean by the relation of succession between cause and effect?

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Q 12: What is constant conjunction? Describe

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ACTIVITY: 6.4

Q4: Can any necessary connection between cause and effect be rationally justified? Discuss.

Ans: .....

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Q5: What is the role of psychological laws of human nature in producing beliefs in causal relation? Explain after Hume.

Ans: .....

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6.6. LET US SUM UP

- 'Cause' is a relative term the co-relative of which is 'effect'. In the empirical sciences where inductive reasoning is applied causality and the law of causation play a significant role as fundamental concept and principle of their method.

- The cause of any effect is totality of those things or circumstances the presence of which has made the effect happen and in absence of which it would not have had happened. In different context the term 'cause' is used to signify different qualities or characteristics. Sometimes it signifies necessary condition of effect. In some other situation it means sufficient condition. There is usage of the term to signify both necessary and sufficient conditions. On some occasion it may be neither sufficient nor necessary but a contributory condition of the effect.

- Cause in Aristotle's term means explanation of object or event. Cause explains in terms of what matter constitutes something or of what parts, constituents element it is made up with; what is the form that matter is moulded into what it is: the efficiency, agency, skill or energy that brings in the changes in matter to give it form and the purpose and aim that ultimately realized by such changes. Thus there are four kinds of causes to explain everything--- material, formal, efficient and final.

- According to David Hume, inductive reasoning from observed instances to the unobserved is based on causal relation. The idea or notion of causation is a complex notion about the relation between events. Hume analyzed this notion into precedence, contiguity and production or necessity. The relation of precedence and contiguity could be justified. However, the relation called production and necessary connection cannot be justified by any evidence.

- According to J.S. Mill cause is the invariable unconditional immediate antecedent of the effect. Quantitatively matter and energy in the cause is equivalent to matter and energy in the effect.

- According to Bacon a generating nature or cause of an event is co-present, co-absent and co-variant in degree with its corresponding generated nature or effect. Bacon assumed that all the complicated events or happening in the world are due to co-ordination of limited number of generating nature or causes. This can be discovered by analyzing their co-presence, co-absence and co-variation. He developed tabular method for this.

- An indispensable factor of the cause is regarded to be a condition. Conditions are either positive or negative. Positive conditions are the presence of the events or state of affairs required for the effect to occur. A negative condition is the absence of those antecedent states of affair the presence of which prevents the effect's coming into existence.

- The necessary condition of an effect is that condition in absence of which effect doesn't occur. A necessary condition must be present in order that the effect comes into existence.

- Sufficient condition means that condition (or a set of conditions) the presence of which is bound to produce the effect. It suffices to produce the effect.

- According to Hume the justification of an inductive reasoning that establishes causal relation between premises and conclusion does not depend on the relation between premises and conclusion but it depends on the psychological laws of association which connect constantly conjoined experiences with a causal link. We read causality in natural happening because of our nature; apart from these laws of association, causality is not in the things and events themselves.



6.7. FURTHER READING

1. Mill, John Stuart, (1843) System of Logic, Ratiocinative and Inductive: Being a Connected View of the Principles and methods of Scientific Investigation, Volume I, John W Parker, London, UK
2. Hume, David, (1988), A Treatise of Human Nature, edited by L A Selby Bigge, Oxford University Press, UK
3. Read, C. (1914), Logic: Deductive and Inductive, Kent & Co. LTD. London, UK



6.8. ANSWERS TO CHECK YOUR PROGRESS

Ans to Q 1: We guide our actions by expectations and predictions of what has already been experienced to follow an antecedent event.

Ansto Q.2: Different senses of cause are- reason why something happens, necessary conditions and sufficient conditions.

Ans to Q.3. Contiguity, succession and constant conjunction.

Ans to Q.4. No

Ans to Q.5. Equivalence

Ans to Q.6. The necessary connection of an effect is that condition in absence of which effect doesn't occur.

Ans to Q.7. According to Plato the world is built with order and regularity and so there is a necessity here because of what has to be, thus causality could be explained via necessity and mathematics. While Aristotle viewed that no events are causeless, while admitting that not all events can have their causes found, because not every event has the sort of regularity which science requires in finding causes.

Ans to Q.8. For Kant the necessary connection between cause and effect was a human intuition given to us by experience of reality.

Ansto Q.9. According to Hume there is no necessary connection between cause and effect. There is only a constant conjunction between the two.

Ans to Q.10. Relation of succession, relation of contiguity and constant conjunction.

Ans to Q.11. The class of events called Cause is experienced to be followed by the class of the events called effect and this type of relation is called relation of succession.

Ans to Q.12. If one instance of a definite kind is experienced to be followed by another instance of some other definite kind and even if it is experienced to be so on many occasions, the relation between two kinds of events is called constant conjunction.



6.9. MODEL QUESTIONS

A. Very short Questions

Q1: Are all regularly successive pairs of events linked by causation?

Q2: What is the co-relative term of cause?

Q3: Is Aristotle's causal theory teleological?

Q4: What does the term generating nature signify in Bacon's writings?

Q5: According to Hume, can necessary connection be justified by empirical evidence?

Q6: Who talked about constant conjunction between cause and effect?

B. Short Questions (Write in about 100-150 words)

Q1: What does causality mean?

Q2: What is material cause?

Q3: What is final cause?

Q4: How does Hume analyze causality?

Q5: How does Bacon explain causal relation?

Q6: What is J.S.Mill's view about causality?

Q7: What is necessary connection?

Q8: Does constant conjunction imply necessity?

Q9: Short notes (Answer in about 100-150 words)

a) Cause and necessary connection

b) Aristotle's theory of cause

c) David Hume's theory of cause

d) Cause and necessary connection

e) Constant conjunction

C. Long Questions (Write in about 300-500 words)

Q1: Explain J.S. Mill's definition of causality.

Q2: What does Aristotle's mean by causation? Explain the four kinds of causes.

Q3: How does Hume analyze the notion of causality?

Q4: What is his psychological explanation of causal relation?

Q5: Explain the concepts of cause and necessary connection with special reference to Plato, Aristotle and Bertrand Russell.

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