

Chapter II

Historical Background for Twentieth Century Concepts of Causality

The Pre-Socratic Period

'Tis a general maxim in philosophy, that whatever begins to exist, must have a cause of existence. This is commonly taken for granted in all reasonings, without any proof given or demanded. 'Tis suppos'd to be founded on intuition, and to be one of those maxims, which tho' they may be deny'd with the lips, 'tis impossible for men in their hearts really to doubt of.

Thales of Miletus (624-550 B.C.) was the first Western thinker who attempted to inquire into the first cause of our cosmos by means of natural science. He maintained that water was the first element of every thing in our universe.

The naturalistic method of thinking Thales suggested was more elaborately carried on in the next generation by Anaximander (611-547 B.C.) and Anaximenes (588-524 B.C.). The former asserted that a substance

¹David Hume, A Treatise of Human Nature
(Harmondsworth: Penguin Books, 1969), p. 126.

underlying all phenomena of experience would be boundless and infinite, whereas the latter reverted to an empirically observable substance, air. Around two centuries later this line of thought influenced Aristotle's notion of material cause.

Thales' method dominated until Parmenides (born about 510 B.C.), a younger contemporary of Heraclitus and an older contemporary of Socrates, introduced a new way of thinking, namely abstract logical investigation. One result was that Aristotle formulated the first theoretical and purely general concept of cause in Western philosophy.

The notion of an efficient cause began to take shape with Empedocles (495-435 B.C.). According to him, our universe is governed by two motive forces, namely, Love and Strife. With these two forces, "The universe undergoes a cyclic process of evolution and devolution as one or the other force dominates."² To explain natural phenomena, Aristotle adopted Empedocles view as one of his own four causes, the efficient cause.

A contemporary of Empedocles, Anaxagoras (500-428 B.C.), however, claimed that all things were composed of

² Albert E. Avey, Handbook in the History of Philosophy, 2nd ed. (New York: Barnes & Noble, 1963), p. 15.

particles which he called 'seeds' which were present in the physical world in infinite number, and that there is one force regulating the universe, namely Nous (Mind).

Nous (Mind) caused a rotation of the mixture, resulting in a separation of objects . . . hair, for example, can come only out of hair, there must be hair present, even though concealed, in bread . . .³

According to Anaxagoras, everything comes into existence out of something like itself. In short, as he called "homoiomereiai"⁴(the Principle of Homoeomereity). Later, Aristotle developed this principle into the theory of Teleology from which the concept of final cause emerged.

As mentioned above, it can be seen that Aristotle did not formulate his well-known four causes entirely independently. Rather he was also influenced by his predecessors – the concept of material cause by the early Milesians, the concept of formal cause by Plato, that of efficient cause by Empedocles and that of final cause by Anaxagoras.

At this point, it becomes necessary for us to state Aristotle's four causes in some detail.

³G. B. Kerferd, "Anaxagoras of Clazomenae," The Encyclopedia of Philosophy 1, ed. Paul Edwards (1967): 115.

⁴Ibid.

The Classic Period (430-325 B.C.)

Aristotle (384-322 B.C.), pictures his famous four causes as follows:

. . . One only knows a thing when one knows why it is, its reason . . .

In the first place, one calls cause that which composes a thing, and that from which it arises. Thus one can say in this sense that bronze is the cause of the statue, and silver is the cause of the phial; and one applies this way of speaking to all things of the same kind. (Material cause.) In a second sense, the cause is the form and the model of things; it is the essential character of the thing and its kind. Thus in music the cause of the octave is the ratio 2:1, and, in a more general way, it is number; and with number, it is the part which enters into its definition. (Formal cause.) In a third sense, the cause is the source from which movement or rest comes. Thus he who, in a certain case, has given advice to act is the cause of the acts which are accomplished; the father is the cause of the child; and generally speaking that which acts is the cause of that which is done; that which produces a change is the cause of the change produced. (Efficient cause.) Fourthly, cause signifies the end and the goal of a thing. Thus health is the cause of walking. If we ask, "Why is he walking?" the answer is, "In order to be well," and when we say this, we believe that we have the cause of the walking. This meaning applies to all the intermediaries who contribute to the attainment of the final end, after the first mover has started the movement. For example, dieting and purgation, or drugs and the instruments of the surgeon can be regarded as means to health: and the only difference is that some are acts and others are instruments. (Final cause.)⁵

Aristotle's four causes, or in other words, the

⁵ Aristotle, "Two Concepts: 'Cause' and 'Chance,'" in Readings in Philosophy, ed. John Herman Randall, Jr., Justus Buchler, Evelyn Shirk (New York: Barnes & Noble Books, 1972), pp. 133-134.

explanatory principles are applied to explain not only physical objects but also all events or changes occurring in our universe; for instance, a biological evolution, a political development and so forth.

Aristotle's four causes were to play a major role in Western philosophy until at least the end of the Medieval Ages.

The Medieval Ages (1-1500 A.D.)

During this period, thought on causality was mainly Aristotelean. For this reason, I shall proceed to the Renaissance.

The Renaissance (1500-1600 A.D.)

After the Medieval Ages, a notion of causality in connection with natural science began to emerge, especially with Francis Bacon (1561-1626 A.D.), the founding father of modern science in England.

Bacon said that we can enter the kingdom of nature, as we can the kingdom of heaven . . . Bacon's argument is that to know anything is to have understood its antecedents or causes and that knowledge of causal relationships is the greater part of science.⁶

Subsequently, his view was elaborated considerably by thinkers of the Modern Period.

⁶Maurice Cranston, "Bacon, Francis," The Encyclopedia of Philosophy 1, ed. Paul Edwards (1967): 238.

The Modern Period (1600-1900 A.D.)

During this period causality received a great deal of attention from philosophers. Yet, the central notion of causality during the early part of this period still involved the traditional one, viz. that of efficient cause. Let us begin with Descartes' point of view.

René Descartes (1596-1650 A.D.) claimed that God was the creator of all things. This means the ultimate cause of the physical world is God. Though his method of enquiry into our epistemic situation, namely, methodical doubt, is modern, his notion of causation is not so much different from the Medieval Ages view.

To back his claim, Descartes says:

. . . the idea that gives me my understanding of a supreme God . . . certainly has in it more objective reality than the ideas that represent finite substances. Now it is manifest by the natural light that there must be at least as much (reality) in the efficient and total cause as in the effect of that cause. For where, I ask, could the effect get its reality from, if not from the cause? And how could the cause give it to the effect unless it possessed it? It follows from this both that something cannot arise from nothing . . .⁷

⁷ René Descartes, "Meditations on First Philosophy," (Third Meditation) in The Philosophical Writings of Descartes, Vol. 2, trs. John Cottingham, Robert Stoothoff and Dugald Murdoch (Cambridge: Cambridge University Press, 1984), p. 28.

The generation after Descartes gives us Benedict De Spinoza (1632-1677 A.D.) Spinoza contended that God was the cause of all things. In addition, he elaborated Descartes' notion of causality by identifying the power of God with the laws governing nature. In *A Theologico-Political Treatise*, Chapter III, he writes that:

By the help of God, I mean the fixed and unchangeable order of nature or the chain of natural events: for I have said before and shown elsewhere that the universe laws of nature, according to which all things exist and are determined, and only another name for the eternal decrees of God, which always involve eternal truth and necessity. So that to say that everything happens according to natural laws, and to say that everything is ordained by the decree and ordinance of God, is the same thing. Now . . . the power in nature is identical with the power of God . . .⁸

We can see that, from the foregoing, Spinoza identifies God with Nature. Or in other words, according to him, God is Nature. This implies that the concept of causality can be elucidated by means of not only God's decree, but also the laws of nature. Manifestly, he wished to reconcile a religious view with natural science which was deluging Europe at that time.

⁸Benedict De Spinoza, "A Theologico-Political Treatise," ch. III, in *Works of SPINOZA*, Vol. 1, trs. R. H. M. Elwes (New York: Dover Publications, Inc., 1951), pp. 44-45.

Moreover, Spinoza also distinguished the notion of cause into two categories; namely, an imminent cause and a transeunt cause - the former is "one which produces a change within itself, as in the case of a man who produces his own voluntary motions and thoughts,"⁹ the latter is one "which produces a change in something else."¹⁰

However, John Locke (1632-1704 A.D.) disagrees with Spinoza that God is the cause of all things. Locke analyses causality by appealing to the idea of power. To illustrate the original source of the notion of power, he explains as follows:

The mind, being every day 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 . . . and so comes by that Idea which we call Power. Thus we say, Fire has a power to melt Gold . . .¹¹

⁹Richard Taylor, "Causation," The Encyclopedia of Philosophy 2, ed. Paul Edwards (1967): 57.

¹⁰Ibid.

¹¹John Locke, An Essay Concerning Human Understanding, ch. XXI ed. Peter H. Nidditch (Oxford: The Clarendon Press, 1975), p. 233.

In short, Locke regards causality as power. And the power we consider, Locke further says, "is in reference to the change of perceivable Ideas. For we cannot observe any alteration to be made in, or operation upon any thing."¹² This implies that we cannot observe the notion of causality directly, but only through reflection or awareness of the mind's own operation. Yet, Locke holds that the idea of causation is objective, not subjective.

According to Locke, power is twofold; viz. an active power and a passive power. The former is able to make something change, the latter able to receive any change. Thus speaking, any thing to be called 'a cause' will possess the active power and any thing to be called 'an effect' will possess the passive power. But Berkeley disagrees with Locke.

George Berkeley (1685-1753 A.D.) argued against Locke's notion of causality. According to Berkeley,

All our ideas . . . we perceive . . . are visibly inactive - there is nothing of Power or Agency included in them. So that one idea or object of thought cannot produce or make any alteration in another.¹³

¹²Ibid., pp. 233-234.

¹³George Berkeley, The Principle of Human Knowledge, ed. G. J. Warnock (London and Glasgow: Collins Clear-Type Press, 1969), p. 76.

To back his argument, Berkeley reasoned as follows:

. . . since they (all our ideas) and every part of them exist only in the mind . . . A little attention will discover to us that the very being of an idea implies passiveness and inertness in it . . . insomuch that it is impossible for an idea to do anything, or, strictly speaking, to be the cause of anything.¹⁴

Nevertheless, Berkeley agreed with Locke that the objects of human knowledge are all ideas. To trace the cause of ideas, he writes:

There is therefore some Cause of these ideas, whereon they depend, and which produces and changes them. That this cause cannot be any quality, or idea, or combination of ideas . . . It must therefore be a substance; but it has been shewn that there is no corporeal or material substance: it remains therefore that the cause of ideas is an incorporeal active substance or Spirit.¹⁵

According to Berkeley, Spirit, Understanding and Will are identical. As he claimed, "A Spirit is one simple, undivided, active being - as it perceives ideas it is called the Understanding, and as it produces or . . . operates about them it is called the Will."¹⁶

¹⁴Ibid., pp. 76-77.

¹⁵Ibid., p. 77

¹⁶Ibid.

Appealing to Spirit in his analysis of causation, Berkeley is called an immaterialist or idealist philosopher. He holds that inanimate bodies cannot act causally upon one another. From this principle, he concluded that what are called natural efficient causes are really signs of what follows them. In *The Principles of Human Knowledge*, he contends that "the connexion of ideas does not imply the relation of cause and effect, but only of a mark or sign with the thing signified."¹⁷ An example to illustrate this:

The fire which I see is not the cause of the pain I suffer upon my approaching it, but the mark that forewarns me of it . . . the noise that I hear is not the effect of this or that motion or collision of the ambient bodies, but the sign thereof."¹⁸

Thus, foreshadowing Hume, it follows that "fire does not cause heat, but is so regularly followed by it that it is a reliable sign of it as long as 'the Author of Nature always operates uniformly' (*Principles*, §107)"¹⁹

¹⁷Ibid., p. 97.

¹⁸Ibid.

¹⁹H. B. Action, "Berkeley, George," The Encyclopedia of Philosophy 1, ed. Paul Edwards (1967): 302.

Furthermore, at this point, necessary connexion becomes an empty concept. Yet, it is of much importance for those who believe in the theory of natural efficient cause.

But, in Berkeley's point of view, there is no such connexion in the external world. Rather, it is the matter of subjectivity. Without the perceiving and active being he calls Mind, Spirit, Soul, or Myself; "neither our thoughts, nor passions, nor ideas formed by the imagination, exist . . ." ²⁰ Or in other words, a man's thoughts or ideas must be caused by some active being. And then, in 1739 when Hume's *A Treatise of Human Nature* was anonymously published, Berkeley's view of necessary connexion found its skeptical expression.

David Hume (1711-1776 A.D.) opened a new era of thought about causality. Hume holds that all our reasonings concerning matters of fact are grounded on the postulated relation of cause and effect. He, therefore, devoted a very long passage both in *A Treatise of Human Nature* and in *An Enquiry Concerning Human Understanding* in analysis of this notion, the relation of cause and effect. Finally he affirms that:

²⁰ Berkeley, The Principle of Human Knowledge, p. 66.

. . . the knowledge of this relation is not, in any instance, attained by reasonings a priori; but arises entirely from experience, when we find that any particular objects are constantly conjoined with each other.²¹

In so speaking, Hume sets himself forth as a genuine empiricist. And, as Macnabb says, his empiricism may be summed up in two propositions:

- (1) All our ideas are derived from impressions of sense or inner feeling. That is, we cannot even conceive of things different in kind from everything in our experience.
- (2) A matter of fact can never be proved by reasoning a priori. It must be discovered in, or inferred from, experience.²²

According to Hume, the notion of causality likely has three components. First there is spatial contiguity, as he said "that whatever objects are consider'd as causes or effects, are contiguous."²³ Secondly there is temporal, as Hume writes: "'Tis that of PRIORITY of time

²¹David Hume, An Enquiry Concerning Human Understanding, sect. 4 ed. Eugene Freeman (Chicago: Paquin Printers, 1971), p. 26.

²²D. G. C. MacNabb, "Hume, David," The Encyclopedia of Philosophy 4, ed. Paul Edwards (1967): 76.

²³Hume, A Treatise of Human Nature, p. 123.

in cause before the effect."²⁴ Upon these two points, Hume was hotly attacked by some of the twentieth century philosophers. However, in the present chapter, we will not look into these controversial issues. For I am confined myself within the extent of historical background for twentieth century concepts of causality. Thirdly there is "a NECESSARY CONNEXION . . . ; and that relation is of much greater importance, than any of the other two above-mention'd."²⁵ This is because, before Hume, most of philosophers, in particular, Descartes and the Scholastics, considered cause and effect as having a necessary connection. But, after a careful enquiry into the original source of the notion of necessary connexion between external objects, Hume asserts that:

We are never able, in a single instance, to discover any power or necessary connexion . . . which binds the effect to the cause . . . We only find, that the one does actually . . . follow the other.²⁶

²⁴Ibid.

²⁵Ibid., p. 125.

²⁶Hume, An Enquiry Concerning Human Understanding, p. 67.

This implies that causal knowledge in the form of 'A causes B' is not one of logical certainty. Experience of A 'alone' does not necessarily lead to B, but logically possibly to not-B. Finally, Hume concludes thus:

It appears . . . that this idea of a necessary connexion among events arises from a number of similar instances which occur of the constant conjunction of these events; . . . that after a repetition of similar instances, the mind is carried by habit, upon the appearance of one event, to expect its customary transition of the imagination from one object to its usual attendant, is the sentiment or impression from which we form the idea of power or necessary connexion. Nothing farther is in the case.²⁷

Since external happenings or objects give us no idea of power, or necessary connexion, Hume believes himself that these two ideas are identical; he proceeds to examine "whether this idea be derived from reflexion on the operations of our own minds, and be copied from any internal impression."²⁸ For before him, it is widely additted that:

We are . . . conscious of internal power; while we feel that . . . we can move the organs of our body, or direct the faculties of our mind. An act of volition produces motion in our limbs, or raises a

²⁷Ibid., p. 81.

²⁸Ibid., p. 69.

new idea in our imagination. This influence of the will we know by consciousness.²⁹

For instance, Locke proposed that ideas of reflection came from our consciousness of our mental processes, and Berkeley claimed that an immaterial substance, namely, Spirit, Mind, Soul, Will or Myself, be the cause of all ideas, including the idea of necessary connection.

But, after contemplating of this, Hume affirms that this influence of volition is "a fact, which, like all other natural events, can be known only by experience . . ." ³⁰ not by consciousness of our mental processes or Mind. To back his claim, Hume writes: ". . . were the power or energy of any cause discoverable by the mind, we could foresee the effect, even without experience; and might, at first, pronounce with certainty concerning it. . ." ³¹ but in reality "From the first appearance of an object, we never can conjecture what effect will result from it." ³²

²⁹Ibid.

³⁰Ibid.

³¹Ibid.

³²Ibid.

After his reasonings, Hume concluded that "our idea of power is not copied from any sentiment or consciousness of power within ourselves . . . , like that in other natural events,"³³ With this conclusion, it is obvious that Hume wants to reject Locke's ideas of reflection.

And, in order to deny Berkeley's view that Spirit or Mind, or the like terminology, is the cause of our all ideas, Hume elucidates that:

. . . in contemplating the operations of mind on body — where we observe the motion of the latter to follow upon the volition of the former, but are not able to observe or conceive the tie which binds together the motion and volition, or the energy by which the mind produces this effect.³⁴

After having argued against both Locke and Berkeley's views, Hume concludes again as follows:

So . . . there appears not, throughout all nature, any one instance of connexion which is conceivable by us. All events seem entirely loose and separate. One event follows another; but we never can observe any tie between them. They seem conjoined but never connected. And as we can have no idea of any thing which never appeared to our outward sense or inward

³³Ibid., p. 72.

³⁴Ibid., pp. 79-80.

sentiment, the necessary conclusion seems to be that we have no idea of connexion of power at all, and that these words are absolutely without any meaning, when employed either in philosophical reasonings or common life.³⁵

This conclusion implies that we are unable to have rational insight into the necessity of the uniformity of experience, and leads Hume back to Pyrrhonism or Skepticism in the Classic Period. This doctrine was founded by Pyrrho of Elis (367-275 B.C.), a contemporary of Aristotle. Sextus Empiricus defines Skepticism as:

. . . an ability, or mental attitude, which opposes appearances to judgments in any way whatsoever, with the result, owing to the equipollence of the objects and reasons thus opposed we are brought firstly to a state of mental suspense and next to a state of 'unperturbedness' or quietude.³⁶

However, in respect of its ultimate goal, Humean Skepticism is different from Pyrrhonism. This is because, for to Sextus Empiricus, the motive of Skepticism is the hope of attaining quietude. Humean Skepticism, on the other hand, emphasized only the epistemic status of our claims to knowledge.

³⁵Ibid., p. 80.

³⁶Sextus Empiricus, "Outlines of Pyrrhonism," in Greek and Roman Philosophy after Aristotle, ed. Jason L. Saunders (New York: The Free Press, 1966), p. 153.

Before closing Section VII of *An Enquiry Concerning Human Understanding*, Hume tries to define 'a cause.' But, he says it is impossible, because the ideas which we form concerning the notion of necessary connection are imperfect. We only experience that "similar objects are always conjoined with similar."³⁷ Nevertheless, for the sake of the definition of cause, Hume writes:

. . . therefore, we may define a cause to be an object, followed by another, and where all the objects similar to the first are followed by objects similar to the second. Or in other words where, if the first object had not been, the second never had existed.³⁸

This is Hume's first definition of cause as a philosophical relation. Besides, if we consider as a natural relation, Hume says: "We may, therefore . . . form another definition of cause, and call it, an object followed by another and whose appearance always conveys the thought to that other."³⁹

Upon these two definitions, Hume reiterates that "both these definitions be drawn from circumstances

³⁷Hume, An Enquiry Concerning Human Understanding, p. 83.

³⁸Ibid.

³⁹Ibid.

foreign to the cause, we cannot remedy this inconvenience, or attain any more perfect definition . . ."40

According to the foregoing definitions, it follows that Hume eliminates the notion of power, as Berkeley considered it so obvious that a man's ideas must be caused by some active being, such as himself or God, from the concept of causality. Or in other words, Hume proposed a new theory of causation; namely, cause as constant conjunction.

Undoubtedly, this theory shook the very basic ground of scientific knowledge as conceived of at least through the late nineteenth century. For, if granted that Hume's theory of constant conjunction is true, the inductively scientific cognition will be uncertain and at best only probable. It is, thus, not surprising that violent antagonism arose against Humean Skepticism. Among antagonists, Immanuel Kant was the most influential.

Firmly committed to a Newtonian mechanistic determinism within nature, Immanuel Kant (1724-1804 A.D.) set himself to defend the necessity and objectivity of scientific knowledge. Constant advancement in Science, Kant believed, demands that there be something which ties

⁴⁰Ibid.

happenings together in an ordered manner. In approaching this problem, Kant considers causality to be one of the principles of order used by the mind. Now, let us see how Kant presented his thesis.

In *A Critique of Pure Reason*, Chapter III (Transcendental Doctrine of Judgment), Kant proposes that the reality may be of two sorts; namely, the phenomenon and the noumenon. The former is an object of our sensible intuition (appearance or sensible entity), whereas by noumenon "we mean a thing so far as it is not an object of our sensible intuition,"⁴¹ or in other words, an object in itself.

Viewing reality this way, Kant presupposes that our mind, by nature, possesses a set of categories. He defines them as "the pure concepts of understanding."⁴² (A 119)

To help illustrate Kant's notion of causality, the table of categories is provided below on the following page.

⁴¹Immanuel Kant, *A Critique of Pure Reason*, trans. Norman Kemp Smith (Trowbridge & London: Redwood Press Limited, 1970), p. 268.

⁴²Ibid., p. 143.

Table of Categories⁴³

I

Of Quantity
 Unity
 Plurality
 Totality

II

Of Quality
 Reality
 Negation
 Limitation

III

Of Relation
 Of Inherence and Subsistence
 (substantia et accidentia)
 Of Causality and Dependence
 (Cause and effect)
 Of Community
 (reciprocity between agent
 and patient)

IV

Of Modality
 Possibility - Impossibility
 Existence - Non-existence
 Necessity - Contingency

Above is the list of all original pure concepts
 of synthesis that the understanding contains within itself
 a priori.

⁴³Ibid., p. 113.

From the above table of categories, it can be seen that Kant classifies the notion of causality under the third group entitled 'Of Relation'. Thus, according to Kant, the concept of Causality is a pure a priori notion that provides a necessary structure for the understanding to organize and, thus, perceive what is given to it in sensation. Experience alone, Kant says, "does indeed show that one appearance customarily follows upon another, but not that this sequence is necessary,"⁴⁴ Or in other words, appearance which does not combine with categories,

. . . could never be for us an object of knowledge, and so would be nothing to us; . . . since it has in itself no objective reality, but exists only in being known, it would be nothing at all."⁴⁵(A 120)

In this point Kant agrees with Hume. But in response to Hume's Skepticism, Kant introduced the concept of categories. Thus, we interpret certain events of type 'A' to be followed by events of type 'B' according to a rule. For instance, every time water is heated at normal atmospheric pressure level, shortly thereafter it boils. With the 'Causality and Dependence' category in our mind, these are interpreted as connected by a necessary rule. According to Kant, if our mind does

⁴⁴Ibid., p. 139.

⁴⁵Ibid., p. 144.

not possess the 'Causality and Dependence' category, we could never have the concept of cause at all, despite our senses

Yet, Kant says: ". . . the categories have meaning only in relation to the unity of intuition in space and time."⁴⁶(B 308) That is, apart from our mode of intuition, the categories are of no use.

At this point, we can see that Kant attempts to reconcile rationalism with empiricism. If his attempt is successful, the skeptics' doubt regarding certainty of our knowledge will be shown to be spurious.

In sum, the categories and experience are interdependent. Kant says: ". . . the concept of a cause is nothing but a synthesis (of that which follows in the time-series, with other appearances) according to concepts."⁴⁷(A 112)

The term 'concepts' here Kant means the fundamental forms or patterns of understanding in our mind. According to him, these fundamental concepts, or in other words, the categories, are necessarily objective.

⁴⁶Ibid., p. 269.

⁴⁷Ibid., p. 139.

He concludes:

Thus the relation of appearance . . . is . . . necessarily determined in time by something preceding in conformity with a rule – in other words, the relation of cause and effect – is the condition of the objective validity of our empirical judgment,⁴⁸ (A 202)

From above mentioned statements, Kant implicitly admits that causality is a necessary connection between certain preceding events and certain antecedent events. He claims that: "All attempts to derive these pure concepts of understanding from experience . . . are entirely vain and useless."⁴⁹ (A 112), but only through "transcendental affinity."⁵⁰ (A 114) The word 'affinity,' Kant defines as the association of the manifold appearances in nature, or the uniformity in nature.

Kant concludes in the last paragraph of Section 2, 'The Deduction of the Pure Concepts of Understanding', Chapter II, Book I of 'A Critique of Pure Reason, as follows:

⁴⁸Ibid., p. 227.

⁴⁹Ibid., p. 139.

⁵⁰Ibid., p. 140.

That nature should direct itself according to our subjective ground of apperception, and should indeed depend upon it in respect of its conformity to law, sounds very strange and absurd. But when we consider that this nature is not a thing in itself but merely an aggregate of appearance, so many representations of the mind, we shall not be surprised that we can discover it only in the radical faculty of all our knowledge, namely in transcendental apperception, in that unity on account of which alone it can be entitled object of all possible experience, that is, nature. Nor shall we be surprised that just for this very reason this unity can be known a priori, and therefore as necessary. Were the unity given in itself independently of the first source of our thought, this would never be possible. We should not then know of any source from which we could obtain the synthetic propositions asserting such a universal unity of nature. For they would then have to be derived from the objects of nature themselves; and as this could take place only empirically, none but a merely accidental unity could be obtained, which would fall far short of the necessary interconnection that we have in mind when we speak of nature.⁵¹ (A 114)

Finally, I would like to reiterate that, according to Kant, "everything that happens . . . presupposes something upon which it follows according to a rule."⁵² In conformity with such a rule, there must be the condition of a rule according to which the effect "invariably and necessarily follows."⁵³ This implies that human experience must be in compliance with the law of causality, which Kant regards as an objective relation.

⁵¹Ibid.

⁵²Ibid., p. 218.

⁵³Ibid., p. 222.

For a further examination of the notion of causation, let us consider Mill's view. Let us see how Mill developed his notion of causality. According to Mill, the law of causation is universal. He asserts thus:

We recognise a law which is universal . . . all instances whatever of succession being examples of it. This law is the Law of Causation. The truth that every fact which has a beginning has a cause, is co-extensive with human experience.⁵⁴

After this assertion of a universality of causation, Mill defines cause as sufficient condition. He says the cause is "the sum total of the conditions positive and negative taken together;"⁵⁵ To illustrate his definition of cause clearly, Mill uses the example of a person who eats of a particular dish and dies in consequence. As for the cause (eating of the dish), Mill says:

. . . there certainly is . . . some combination or other on which death is invariably consequent: as, for instance, the act of eating of the dish, combined with a particular bodily constitution, a particular state of present health, and perhaps even a certain state of the atmosphere; the whole of which circumstances perhaps constituted in this particular case the conditions of the phenomenon, or, in other words, the set of antecedents which determined it. The real Cause is the whole of these antecedents; and we have . . . no right to give the name of cause to

⁵⁴John Stuart Mill, *A System of Logic* (London & Colchester: Spottis Woode, Ballantine & Co., 1970), p. 212.

⁵⁵*Ibid.*, p. 217.

one of them exclusively of the others.⁵⁶

Mill finally proposed that he had discovered five causal methods of experimental inquiry (but carelessly this chapter of his Logic is titled 'Of the Four Methods of Experimental Inquiry'. To illustrate them, let us consider their canons as quoted below.

1. Method of Agreement.

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.⁵⁷

Mill's symbolisation of the above mentioned:

ABC - abc, ADE - ade; A - a

2. Method of Difference.

If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only 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.⁵⁸

Mill's symbolisation:

ABC - abc, BC - bc; A - a

⁵⁶Ibid., p. 214.

⁵⁷Ibid., p. 253.

⁵⁸Ibid., p. 256.

3. Joint Method of Agreement and Difference.

If two or more instances in which the phenomenon occurs have only one circumstance in common, while two or more instances in which it does not occur have nothing in common save the absence of that circumstance, the circumstance in which alone the two sets of instances differ is the effect, or the cause, or an indispensable part of the cause, of the phenomenon.⁵⁹

Mill's symbolisation:

ABC - abc, ADE - ade, and

$\bar{A}BC - \bar{a}bc, \bar{A}DE - \bar{a}de; A - a$

4. Method of Residues.

Subduct from any phenomenon such part as is known by previous inductions to be the effect of certain antecedent, and the residues of the phenomenon is the effect of the remaining antecedents.⁶⁰

Mill's symbolisation:

ABC - abc, BC - bc; A - a

5. Method of Concomitant Variations.

Whatever phenomena varies in any manner whenever another phenomenon varies in some particular manner, is either a cause or an effect of that phenomenon, or is connected with it through some fact of causation.⁶¹

Mill's symbolisation:

$A'BC - a'bc, A''BC - a''bc, A'''BC - a'''bc; A - a$

⁵⁹Ibid., p. 259.

⁶⁰Ibid., p. 260.

⁶¹Ibid., p. 263.

Obviously, Mill explains causation in terms of observable relation. This is contrary to the intuitionist view of the causal principle. Mill saw that Hume's analysis of cause as a constant conjunction could be easily rejected. For there are events that are constantly conjoined by other events; for instance, a succession of day and night, but there is no causal relation between them. Thus, to elaborate Hume's theory, Mill offered his sufficient condition thesis.

Mill defines 'cause' as a Sufficient Condition. If asked, what conditions are sufficient for combustion, Mill's answer is, as John Hospers has noted:

1. There must be a combustible material. 2. There is a temperature requirement . . . 3. There must be oxygen. When all these conditions are present, the substance burns.⁶²

Or in other words, the combination of conditions, either an event or a state of a substance or a state of environment, that together constitute the sufficient condition is the cause of the event.

And, on the methodological level, Mill proposed

⁶²John Hospers, An Introduction to Philosophical Analysis (New Delhi: Allied Publishers Private Ltd., 1977), p. 292.

his so-called 'Four Methods' for discovering causal connections; namely, (1) the Method of Agreement, (2) the Method of Difference, (3) the Joint Method, (4) the Method of Residues, (5) the Method of Concomitant Variations.

After Mill, we enter the contemporary period.



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