(The Principle of Causality (from the Book of Our Philosophy

<"xml encoding="UTF-8?>

The principle of causality is one of the primary propositions known to people in their ordinary lives. This principle states that for everything there is a cause. It is one of the necessary rational principles; for (p. 808) a human being finds at the heart of his nature a motive that causes him to attempt to explain the things he encounters and to justify the existence of such things by disclosing their causes. This motive is inborn in human nature.

Also, is may be present in a number of animals. Thus, such animals instinctively pay attention to the source of motion in order to know its cause. They search for the source of a sound, again in order to know its cause.

That is why human beings are always confronted with the question: 'Why . . .?' This question is raised concerning every existence and every phenomenon of which they are aware, so that if they do not find a specific cause [of such an existence or such a phenomenon], they believe that there is an unknown cause that produced the event in question.

The following things depend on the principle of causality: (1) demonstration of the objective reality of sense perception; (2) all the scientific theories and laws that are based on experimentation; and (3) the possibility of inference and its conclusions in any philosophical or scientific field. Were it not for the principle and laws of causality, it would not be possible to demonstrate the objectivity of sense perception, nor any scientific theory or law.

Further, it would not be possible to draw any inference in any field of human knowledge on the .basis of any kind of evidence. This point will soon be clarified

Causality and the Objectivity of Sense Perception

In 'The Theory of Knowledge', we pointed out that sense perception is nothing but a form of conception. It is the presence of the form of the sensible thing in the sense faculties. It does not have the character of a true disclosure of an external reality.

That is why, in the case of certain illnesses, a human being may have sense perception of certain things, without assenting to the existence of those things. Therefore, sense perception is not a sufficient ground for assent, judgement or knowledge concerning the objective reality. (p. 304)

As a result of this, the problem we face is that if sense perception is not in itself evidence for the existence of the sensible thing that lies outside the limits of awareness and knowledge, then how can we assent to the existence of the objective reality? The answer is revealed in

light of our study of the theory of knowledge. It is as follows. The assent to the existence of an objective reality of the world is a primary necessary assent. For this reason, it does not require evidence.

However, this necessary assent indicates only the existence of an external reality of the world in general. But the objective reality of every sense perception is not known in a necessary manner. Therefore, we need evidence to prove the objectivity of every specific sense perception. This evidence is the principle and laws of causality.

The occurrence [in the senses] of the form of a specific thing under specific circumstances and conditions reveals, in accordance with this principle, the existence of an external cause of that thing. Were it not for this principle, sense perception or the presence of a thing in the senses could not reveal the existence of that thing in another sphere.

Because of this, in a specific case of illness, a human being may perceive certain things, or imagine that he sees them, without discovering an objective reality of those things. This is because the principle of causality does not prove the existence of that reality, as long as it is possible to explain a sense perception by the specific case of the illness.

Rather, it proves the objective reality of sense perception if there is no explanation of it in light of the principle of causality except by an objective reality that produces the sense perception.

From this one can draw the following three propositions.

First, 'Sense perception by itself does not disclose the existence of an objective reality, since it is conception, and it is not the task of conception (regardless of its kind) to give a true disclosure'. Second, 'Knowledge of the existence of a reality of the world in general is a necessary and primary judgement that does not require evidence; that is, it does not require prior knowledge'– this is the point separating idealism from realism. (p. 305) Third, 'Knowledge of an objective reality of this or that sense perception is acquired only in light of the principle of causality'.

Causality and Scientific Theories

Scientific theories in the various experimental and observational fields are in general primarily dependent on the principle and laws of causality. If causality and its proper order are eliminated from the universe, it becomes very difficult to form a scientific theory in any field. For the clarification of this, we must point out a number of causal laws from the philosophical group [of laws] on which science rests.

These laws are the following:

The principle of causality that asserts that every event has a cause;

the law of necessity that asserts that every cause necessarily produces its natural effect, and

that it is not possible for effects to be separate from their causes;

the law of harmony between causes and effects that asserts that every natural group that is essentially in harmony must also be in harmony with respect to [its] causes and effects.

Thus, in light of the principle of causality, we know, for example, that the radiation emitted from the radium atom has a cause, which is the internal division in the content of the atom. Further, in light of the law of necessity, we find that this division necessarily produces the specific radiation when the necessary conditions are fulfilled. The presence of these conditions and the production of this radiation are inseparable.

The law of harmony is the basis of our ability to generalize the phenomenon of radiation and its specific explanation to all the radium atoms.

Thus, we say that as long as all the atoms of this element are essentially in harmony, they must also be in harmony with respect to (p. 306) their causes and effects. If scientific experimentation discloses radiation in some of the. radium atoms, it becomes possible to assert this radiation as a common phenomenon of all similar atoms, given the same specific circumstances.

It is clear that the last two laws - that is, the law of necessity and the law of harmony - are the result of the principle of causality. If there were no causality in the universe between some things and some other things - (that is,] if things happened haphazardly and by chance - it would not be necessary that, when there is a radium atom, radiation exists at a specific degree. Also, it would not be necessary that all the atoms of this element share the specific radiational phenomena. Rather, as long as the principle of causality is excluded from the universe, it would be possible that radiation pertains to one atom and not to another, just because of haphazardness and chance. Thus, both necessity and harmony are attributed to the principle of causality.

After having clarified the three main points (causality, necessity- and harmony), let us go back to the sciences and scientific theories. We see with clarity that all the theories and laws involved in the sciences are in truth established on the above main points, and depend on the principle and laws of causality. If this principle were not taken as a fixed philosophical truth, it would not be possible to establish a theory and to erect a general and comprehensive scientific law.

The reason is that the experiment performed by the natural scientist in his laboratory cannot cover all the parts of nature. Rather, it covers a limited number of parts that are essentially in harmony. Thus, such an experiment discloses that such parts share a specific phenomenon. When the scientist is certain of the soundness, precision and objectivity of his experiment, he

immediately postulates a theory or a general law applicable to all the parts of nature that resemble the subject of his experiment.

This generalization, which is a basic condition for establishing a natural science, is not justified except by the laws (p. 307) of causality in general – particularly, the law of harmony which [as mentioned,] asserts that every group that is essentially in harmony must also be in harmony with respect to [its] causes and effects.

Therefore, had there not been causes and effects in the universe, and had things occurred by pure chance, it would not have been possible for the natural scientist to say that what is confirmed in his own laboratory is applicable with no restriction to every part of nature. Let us illustrate this by the simple example of the natural scientist who proved by experimentation that bodies expand when heated.

Of course, his experiments did not cover all the bodies in the universe. Rather, he performed his experiments on a number of various bodies, such as the wooden car wheels on which iron frames smaller than they are placed when heated.

Thus, as soon as these frames cool off, they contract and clasp the wood firmly. Let us suppose that the scientist repeats this experiment on other bodies a number of times. At the end of the experimental course, he cannot escape the following question: 'Since you have not covered all the particular bodies, how then can you believe that new frames other than those you have tried will also expand by heat?'

The only answer to this question is the principle and laws of causality. Since the mind does not accept haphazardness and chance, but explains the universe on the basis of causality and its laws, including those of necessity and harmony, it finds in limited experiments a sufficient ground for accepting the general theory that asserts the expansion of bodies by heat.

This expansion that experiments disclosed did not occur haphazardly. Rather, it was the result or effect of heat. Since the law of harmony in causality dictates that a single group in nature is in harmony with respect to its causes and effects, or agents and results, it is no wonder then that all the reasons of securing the applicability of the phenomenon of expansion to all bodies are met.

Thus, we know that the positing of the general theory was not possible (p. 308) without starting from the principle of causation. Hence, this principle is the primary foundation of all the experimental sciences and theories. In short, the experimental theories do not acquire a scientific character unless they are generalized to cover fields beyond the limits of particular experiments, and are given as a general truth.

However, they cannot be given as such except in light of the principle and laws of causality.

Therefore, the sciences in general must consider the principle of causality and the closely related laws of necessity and harmony as fundamentally admitted truths, and accept them .prior to all the experimental theories and laws of the sciences

Causality and Inference

The principle of causality is the foundation on which all attempts of demonstration in all the spheres of human thought rest. This is because demonstration by evidence for a certain thing means that if the evidence is sound, it is a cause of the knowledge of the thing that is the object of demonstration. When we prove a certain truth by a scientific experiment, a philosophical law or a simple sense perception, we only attempt to have the proof as a cause of the knowledge of that truth.

Thus, were is not for the principle of causality and [the law of] necessity, we would not he able to do so. The reason is that if we discounted the laws of causality and did not accept the necessity of the existence of specific causes of every event, there would not be any link between the evidence on which we rely and the truth that we attempt to acquire by virtue of this evidence. Rather, it becomes possible for the evidence to be sound without leading to the required result, since the causal relation between the pieces of evidence and the results, or between the causes and the effects, is broken off.

Thus, it becomes clear that every attempt at demonstration depends on the acceptance (p. 309) of the principle of causality; otherwise, it is a wasteful and useless attempt. Even the demonstration of the disproof of the principle of causality, which is attempted by some philosophers and scientists, also rests on the principle of causality.

For those who attempt to deny this principle by resorting to a certain evidence would not make this attempt had they not believed that the evidence on which they rely is a sufficient cause of the knowledge of the falsehood of the principle of causality. But this is in itself a literal .application of this principle

Mechanics and Dynamics

This leads to the following conclusions. First, it is not possible to prove or to demonstrate empirically the principle of causality, since the senses do not acquire an objective quality except in light of this principle. We prove the objective reality of our sense perceptions on the basis of the principle of causality.

Therefore, it is not possible that for its demonstration, this principle depends on the senses and relies on them. Rather, it is a rational principle that people accept independently of the

external senses.

Second, the principle of causality is not an experimental scientific theory. Rather, it is a rational philosophical law above experimentation, for all scientific theories depend on it. This became fully clear after having learned that every scientific conclusion that relies on experimentation faces the problem of generality and comprehensiveness.

This problem is that the experiment on which the conclusion rests is limited. How then could it by itself be evidence for a general theory? We learned that the only solution for this problem is the principle of causality, since it is evidence for the generality and comprehensiveness of the conclusion.

Thus, if we assume that the principle of causality itself rests on an experiment, it becomes necessary that (p. 310) we face the problem of generality and comprehensiveness once again. An experiment does not cover the universe; how then would it be considered evidence for a general theory? When encountering this problem with respect to the various scientific theories, we used to solve it by resorting to the principle of causality, since this principle is sufficient evidence for the generality and comprehensiveness of the conclusion.

But if this principle itself is considered experimental and the same problem is encountered with respect to it, we will be totally unable to solve this problem. It is necessary, therefore, that the principle of causality be above experiments and a fundamental principle of the experimental conclusions in general.

Third, it is not possible to give any kind of evidence for the disproof of the principle of causality. The reason is that every attempt of this kind entails an admission of this principle. Therefore, this principle is fixed prior to any evidence given by human beings.

These conclusions can be summarized as follows. The principle of causality is not an experimental principle. Rather, it is a necessary rational principle. In light of this, we can distinguish between mechanics and dynamics, and between the principle of causality and the principle of indeterminacy.

The mechanical explanation of causality rests on the basis of causality as an experimental principle. According to mechanical materialism, this principle is nothing but a material relation between material phenomena in the experimental field and is discovered by scientific methods. That is why it is natural that mechanical causality collapses if experimentation fails in some scientific fields to disclose the causes and agents behind the phenomenon in question. That is because this kind of causality is not attained except on an experimental basis. If experimentation works against it, and practical application does not prove it, then it falls short of scientific confidence and consideration.

However, according to our view of causality, which asserts that causality is a rational principle above experimentation (p. 311) the situation is completely different with regard to various aspects. First, causality is not limited to the natural phenomena that appear in the experiment. Rather, it is a general law of existence at large, which includes the natural phenomena, matter itself, and the various kinds of existence that lie beyond matter, Second, the cause whose existence is confirmed by the principle of causality need not be subject to experimentation, or be a material thing.

Third, the fact that experimentation does not disclose a specific cause of a certain development or of a certain phenomenon does not mean a failure on the part of the principle of causality, for this principle does not rest on experimentation, which can be shaken in the case of the absence of experimentation. In spite of the failure of experimentation to discover the cause, philosophical confidence in the existence of such a cause remains strong, in accordance with the principle of causality.

The failure of experimentation to discover the cause is due to two things: either to the fact that experimentation is limited and does not extend to the material reality and occurrence of specific attachments, or to the fact that the unknown cause lies outside empirical thought, and is beyond the world of nature and matter.

By virtue of the above, we can distinguish the basic differences between our idea of the principle of causality and the mechanical idea of this principle. We can also see that the doubt raised concerning this principle was only due to the interpretation of it in accordance with the deficient mechanical notion.

The Principle of Causality and Microphysics

In light of the conclusions drawn above regarding the principle of causality, we can defeat those strong attacks that were waged in microphysics against the law of (p. 312) necessity, and consequently, against the principle of causality itself. In atomic physics, there was the tendency that asserts that the necessary regularity stressed by causality and its laws cannot be true on the level of microphysics.

Thus, it may be true that the causes themselves produce the effects themselves on the level of scholastic physics or on the level of the physics of the naked eye. Furthermore, the influence of causes acting on the same particular circumstances must necessarily lead to the saint results, such that we can be sure of the nature and necessitv of the results due to a study of the causes and natural conditions.

However, everything appears different if we try to apply the principle of causality to the atomic

world. That is why the physicist Heisenberg1 declared that it is impossible for us to measure with precision the quantity of the motion of a simple body and to determine at the same time the position of this body in the wave related to it, in accordance with the positive mechanics called for by Louis de Broglie.2 The more precise the measurement of this body's position, the more is this measurement a factor in the readjustment of the quantity of motion, and consequently in the readjustment of the velocity of the small body in an unpredictable manner. Further, the more precise the measurement of the motion, the more indeterminate does the position of the small body become.3

Thus, physical events in the atomic sphere cannot be measured unless they involve some unmeasurable disorder. The more profound our precision of the scientific measurements, the more distant do we become from the objective reality of those events. This means that it is not possible to separate a thing observed in microphysics from the scientific instrument used by the scientist to study that thing.

Similarly, it is not possible to separate chat thing from the observer himself, since different observers working on the same subject with the same instrument [may] achieve different measurements. With this, the idea of indeterminacy arose; this idea is in full contradiction against the principle of causality (p. 313) and against the basic rules that governed physics previously.

Attempts were made to replace necessary causality by what is called 'uncertainty relations' or 'laws of probability', advocated by Heisenberg who insisted that the natural sciences, such as the human sciences, cannot make predictions with certainty when considering a simple element. Rather, the utmost they can do is to form a probability.

In fact, all these scientific doubts and suspicions that the scientists raised in microphysics are based on a specific notion of the principle and laws of causality that is in disagreement with our option of this principle and these laws. We do not wish to disagree with these scientists over their experiments, or to ask them to overlook and abandon the discoveries made by means of these experiments.

Furthermore, we do not intend to minimize the value and importance of such discoveries. Rather, we differ from those scientists in our general notion of the principle of causality. On the basis of this difference, all the above-mentioned attempts to destroy the principle and laws of causality become insignificant.

Put in more detail, if the principle of causality were a scientific principle that rests on experimentation and observation in the ordinary fields of physics, it would be dependent on experimentation for its demonstration and generality.

Thus, if we do not achieve clear applications of it in the atomic field and cannot discover a necessary order in this field that rests on the principle and laws of causality, then it would be our right to doubt the value of this principle itself and the extent of its soundness and generality.

But we have already shown (1) that the applicability of the principle of causality to the ordinary fields of physics and the belief that causality is a general order of the universe in these fields are not the result of a pure experimental evidence; and (2) that the principle of causality is a necessary principle above experimentation.

If this were not so, no natural science at all would be possible. If this becomes clear to us, and we give the principle of causality its natural place in the chain of human thought, (p. 314) our inability to apply it experimentally in some natural fields and our failure to discover by scientific methods the complete necessary order in these fields cannot shake this principle.

All the observations gathered by scientists in light of their microphysical experiments do not show that scientific evidence has proved the falsity of the principle and laws of causality in this exact field, which is one of the many natural fields.

It is clear that the lack of scientific and experimental capabilities does not affect the principle of causality, neither in part nor as a whole, since this principle is necessary and above experimentation. There are, then, two explanations of the failure of the scientific experiments in the attempt at grasping the mysteries of the necessary order of the atom.

The first is a deficiency in the scientific methods and an unavailability of the experimental instruments that give the scientist the opportunity to look over all the material conditions and circumstances. A scientist may work on the same subject with the same instrument on a number of occasions.

Yet, he [may] reach different results, not because the subject of his work is free from any necessary order, but because the available experimental instruments are insufficient to disclose to him the exact material conditions whose differences lead to the differences among the results. It is natural that the experimental instruments concerning the atomic fields and events are more deficient than the experimental instruments employed in other physical fields that are less concealed and clearer.

The second is the effect produced in the subject by the scientific measurements and instruments, due to the subject's delicacy and smallness. This effect is critical and not subject to scientific measurements and study. The scientific instruments may reach the highest level of precision, perfection and profundity, yet in spite of this the scientist still faces the same problem.

This is because he finds himself confronted with physical events that he cannot measure without introducing in them an unmeasurable disorder. With this, his position regarding these events is different from his position regarding experiments of physics measured by the naked eve. The reason is that in those experiments, he can apply his measurements without (p. 315) any readjustment in the thing to be measured.

Even when he makes some readjustment in that thing, this readjustment itself will be measurable, In microphysics, on the other hand, the minuteness and strength of the instrument may itself be the cause of that instrument's failure, since it causes a change in the observed subject. Therefore, that subject cannot be studied in an independent objective manner.

That is why John-Louis Destouches4 says regarding a small body chat instead of the intensity of light being what is important, it is the length of the light wave that matters. Whenever we light that small body by a short wave - that is, by a wave of a large frequency - the motion of that body becomes subject to disorder.

Both causes are attributed to the failure of the scientific experimental instruments and observations either to regulate the observed subject by all its material conditions and circumstances, or to measure with precision the effect that the experiment itself produces in that subject. All of this confirms one's inability to view the necessary order governing, for example, the small bodies and their motion, and to predict with precision the path that these bodies will follow. Further, this does not prove their freedom, nor does it justify the introduction .of indeterminacy in the material realm and the elimination of the causal laws from the universe

Why Things Require Causes

We will now discuss a new aspect of the principle of causality - namely, the response to the following questions: 'Why do things require causes or agents without which they cannot come to exist; and what is the real cause that makes them dependent on those causes and agents?'

These are questions that we face, of course, after having accepted the principle of causality. As long as the things that are contemporaneous with us in this universe are in general subject to the principle of causality (p. 316) and exist in accordance with the laws of causality, we must inquire about the secret of their subjugation to this principle. Can this subjugation be attributed to something essential in those things of which they cannot at all be free? Or is it attributable to an external cause that makes them in need of causes or agents? Whether this or that is true, [the question remains] as to the limits of this secret on which the principle of causality rests. Further, is it or is it not common to all the various kinds of existence? .Four theories resulted from attempts made to respond to these questions

I. The Theory of Existence

This theory states that an existent requires a cause for its existence. This requirement is essential to the existence. We cannot conceive an existence free from this requirement. The reason behind the requirement for a cause is a secret hidden in the innermost being of existence. The consequence of this is that every existence is caused.

Some Marxist philosophers adopt this theory, relying in their scientific justification of it on experiments, which indicate in the various fields of the universe that existence in its different forms and kinds disclosed by experimentation cannot be free from its cause and cannot dispense with its agent. Causality is a general law of existence as confirmed by scientific experiments. The assumption of an existence without a cause is contradictory to this law. That is why such an assumption is a kind of belief in haphazardness for which there is no room in the general order of the universe.5

By way of this, they have attempted to accuse theology of upholding haphazardness because it upholds the existence of a first cause not caused, or not preceded by an agent. Since this existence, which theology is alleged to accept, is an exception to the principle of causality, (p. 317) it is, therefore, the result of haphazardness. But science has proved that there is no haphazardness in existence. Hence, one cannot admit this divine cause that metaphysics advocates.

Once again, these thinkers were at error for wishing to discover the secret of the requirement for a cause, and to know by means of scientific experiments the limits of causality and the extent of the broadness of such limits. They erred earlier when attempting to infer the principle of causality itself, particularly, from experiments and scientific induction about the universe.

Scientific experiments are not applicable except in their own sphere, which is a limited material realm. The most they disclose is the subjugation of things in that realm to the principle of causality. Thus, explosion, boiling, burning, heat, motion, as well as other similar natural phenomena do not exist without causes. It is not within the scientific possibilities of experiments to indicate that the secret of the requirement for a cause lies at the heart of existence in general. It is possible that this secret is fixed in specific forms of existence, and that the things appearing in the experimental field are of those specific forms.

Therefore, it is incorrect to consider experimentation as an evidence that existence in general is subject to agents or causes, as long as experimentation is not directly in touch with anything except the material realm of existence.

Further, as long as its activity is in this realm with which it is directly in touch, it will not extend beyond the clarification of the causes and effects that proceed from those causes to a

discovery of the cause that makes those effects in need of those causes. If experimentation and its limited means fall short of forming a clear answer to this issue, then one must study this issue on the basis of rational principles and in an independent philosophical manner. As the principle of causality itself is one of the purely philosophical principles, as you have already learned, so also are the investigations concerning it and the theories that treat its limits. We must point out that the accusation that the idea of the first cause is a kind of a (p. 318) belief in haphazardness implies a misunderstanding of this idea and the notions on which it rests. This is because chance is nothing but the existence, without a cause, of something with respect to which existence and non-existence are the same.

Thus, anything that includes the possibility of existence and the possibility of non-existence to the same degree, and then comes into existence without a cause is chance. But the idea of the first cause proceeds from the assertion that existence and non-existence are not equal in the first cause. Therefore, this cause is not both possible of existence and possible of non-existence. Rather, its existence is necessary, and its nonexistence is impossible. It is intuitive that a belief in a necessary being characterized as such does not at all imply an assent to haphazardness.

II. The Theory of Creation

This theory considers the need of things for their causes as based on the creation of these things. Explosion, motion and heat, for example, require causes for themselves, only because they are things that exist after they had not existed.

Thus, it is the coming into existence that requires a cause, and is the main reason for our raising the following question regarding every reality contemporaneous with us in this universe: 'Why did it exist?' In light of this theory, the principle of causality becomes limited to events in particular. Thus, if a thing exists continuously and always, and has not come into existence after not having existed, there will be no need in it for a cause, nor will is enter the specific realm of causality.

The present theory went too far in restricting causality, as the previous theory went too far in generalizing causality. From a philosophical point of view, there is nothing to justify the present theory. In fact, the attribution of the coming into existence to the thing's existing after not having existed is like the existence of warmth in a certain water that had not been warm. It does not matter to the mind whether this warmth comes into existence after non-existence, or whether it exists continuously. In either case, the mind requires a specific cause for it. (p. 319) Extension of a thing's age and history to the furthest times would not justify that thing's

existence, nor would it make it dispense with a cause. In other words, since the coming into existence of the warmth requires a cause, extending the warmth [over time] would not be sufficient to free it from this requirement.

This is because its extension makes us pursue further the question about its cause, regardless of the length of the extension process.

III, IV. The Theories of Essential Possibility and Existential Possibility

These two theories assert that what makes things need their causes is possibility. However, each of the two theories has its own notion of possibility that differentiates it from the other theory. The difference between them is a manifestation of a deeper philosophical difference concerning quiddity and existence. Since the scope of this book does not permit a discussion and a study of this difference, we will limit ourselves in our investigation to the theory of existential possibility, due to the fact that this theory rests on the view that asserts the fundamentality of existence - that is, the correct view concerning the deeper philosophical difference mentioned above.

The theory of existential possibility was advanced by the great Islamic philosopher, Sadr ad-Din ash-Shirazi, who begins this theory by the analysis of the principle of causality itself. This analysis led to his attainment of the secret. His grasp of the real cause behind the need of things to have their causes did not require of him anything other than a deep philosophical understanding of the principle of causality.

Now, we begin, as he began, by studying and scrutinizing causality. There is no doubt that causality is a relation between two existences: the cause and the effect. Therefore, it is a kind of link between two things. But links are of various kinds and types. (p. 320) The painter is linked to the tablet on which he draws. The writer is linked to the pencil with which he writes. The reader is linked to the book that he reads. The lion is linked to the iron chain that surrounds his neck. The same is true of the remaining relations and links among [other] things. However, an obvious fact appears clear in all the examples of linkage presented above. It is this: each of the two linked things has a specific existence prior to its link with the other thing. The tablet and the painter are both in existence before the act of painting comes into being. Similarly, the writer and the pencil are both in existence before each of them is linked to the other.

Again, the reader and the book both exist independently, and later, linkage occurs to them. Thus, in all these examples, a link is a relation that occurs to the two things after they had both existed. That is why a link is one thing, while the existence of the two linked things is another.

In its essence, the tablet is not a link to the painting, nor is the painter in essence a mere link to the tablet. Rather, linkage is a quality that happens to both of them after each had existed independently.

This difference between the reality of the link and the independent existence of each of the two linked things is evident in all kinds of links, to the exclusion of one kind – namely, the link between two things by means of the link of causality. If, for example, B is linked to A causally, and if B is an effect or product of A, we will have two things one of which is an effect (this being B), while the other is a cause (this being A). The causality between the two, on the other hand, is the kind of link that one of them has to the other.

But the question is this: does B have an existence independent of its link to A, and then experiences linkage, as is the case with the tablet in relation to the painter? It does not take much examination to answer in the negative. If B has a real existence prior to its link with its cause, it will not be an effect of A. This is because as long as it exists independently of its link to A, (p. 321) it is not possible for it to be the effect or product of A.

Causality by nature requires that the effect does not have a reality prior to its link with its cause; otherwise, it will not be an effect. This makes it clear that the existence, which is an effect, has no reality except the very link and relation to the cause. This is the main difference between the link of the effect to the cause and the link of the tablet to the painter, the pencil to the writer, or the book to the reader. The tablet, the pencil and the book are things characterized by linkage to the painter, the writer and the reader. But B is not something that has a link or a relation to the cause, for to suppose it as having such a link requires that it has an independent existence to which linkage occurs as it occurs to the tablet in the hands of the painter. But with this, B would cease to be an effect.

Rather, it becomes the very linkage, in the sense that its being and existence become a conjunctive being and a relational existence. That is why the discontinuity of its linkage to its cause is a destruction of it and an end to its being, for its being is represented in that linkage. On the contrary, if the tablet is not linked to the painter in a specific act of painting, it will not lose its specific being and existence.

If we can draw this important conclusion from the analysis of the principle of causality, we can immediately give an answer to our basic question and know the secret of the things' need for their causes. In light of the preceding discussion, [it becomes clear that] the secret of this is that the external realities on which the principle of causality operates are nothing in fact other than relations and links.

Therefore, relations and links are constitutive of the being and existence of these things. It is

clear that if a reality is relational – that is, if it is the very relation and link– it cannot be detached from the thing to which it is essentially linked or related. That thing is its cause or agent, for it cannot exist independently of it.

Thus, we know that the secret of these external realities that are contemporaneous with us for requiring a cause is not their coming into existence nor the possibility of their quiddities. Rather, this secret (p. 322) lies hidden in their existential structure and in the heart of their being. Their external reality is the very relation or link, and the relation and link cannot dispense with the thing to which they are related or linked.

At the same time, we also know that if the external reality is not one of conjunction and relation, the principle of causality will not be applicable to it. Therefore, external existence is not, as a whole, governed by the principle of causality. Rather, this principle governs the relational existents whose reality expresses linkage and relation.

Fluctuation between Contradiction and Causality

In spite of the fact that Marxism takes the dialectical contradictions as its model in its analytic investigations of the various aspects of the universe, life and history, still it does not completely escape wavering between the dialectical contradictions and the principle of causality. Since it is dialectical, it emphasizes that growth and development result from the internal contradictions, as was explained in earlier discussions.

Thus, the internal contradiction is sufficient as an explanation of every phenomenon in the universe, without need for a higher cause. But, on the other hand, Marxism admits the cause-effect relation, and explains this or that phenomenon by external causes, and not by the contradictions that are stored in the innerness of that phenomenon.

Let us take an example of this wavering from the Marxist historical analysis. On the one hand, Marxism insists that the presence of internal contradictions in the innermost being of the social phenomena is sufficient for the development of such phenomena in a dynamic motion. But it also asserts that the formidable social edifice is established as a whole on one principle – namely, the productive forces –and that the intellectual conditions, the political conditions and the like are nothing but superstructures in that edifice and reflections, in another form, of the productive method on which edifice is erected. This means that the relation between these superstructures and the productive forces is the relation of an effect (p. 323) to a cause. There is no internal contradiction but causality.6

It is as if Marxism realized that its position oscillates between internal contradictions and the principle of causality. Thus, it attempted to reconcile both sides. It imposed on the cause and effect a dialectical sense, and rejected its mechanical notion. On the basis of this, is allowed

itself to use in its analysis the cause-effect procedure in a Marxist dialectical fashion. Thus, Marxism rejects the causality that takes a straight course in which the cause remains external to its effect, and the effect negative in relation to its cause; for such causality is in conflict with the dialectic (that is, with the process of essential growth in nature). This is because the effect in accordance with this causality cannot be richer and more developed that its cause, for increase in richness and development would be inexplicable.

But what Marxism intends by the cause and effect is this. The effect is the product of its contradictory: thus it develops and grows by an internal motion, in accordance with the contradictions it involves, so that it returns to the contradictory from which it sprang, in order to interact with it and, by means of its union with it, form a new composition more self-sufficient and richer than the cause and effect separately. This notion is in agreement with the dialectic and expresses the dialectical triad (the thesis, antithesis and synthesis).

The cause is the thesis, the effect is the antithesis, and the union which is a link between the two is the synthesis. Causality here is a process of growth and completion by way of the production of the effect from the cause (that is, the antithesis from the thesis). The effect in this process is not produced negatively. Rather, it is produced accompanied by its internal contradictions that support its growth and preserve its cause in a loftier and more complete composition.

In our previous discussion of the dialectic, we expressed our view regarding these internal contradictions (p. 324) whose union and struggle in the interior of a being lead to the growth of that being. In light of the Marxist deeper notion of the cause-effect relation, we can know the error of Marxism in its notion of causality and the growth of the effect to which this form of causality leads, as well as the completion of the cause by union with its effect.

Since the effect is a kind of relation and link to its cause, the cause cannot be completed in a loftier composition by means of the effect. In the work Our Economy, p. 23, we discussed some of Marx's applications of his dialectical notion of causality on a historical level, where he tries to prove that the cause is completed by its effect and unites with it in a richer composition. In that discussion of ours, we were able to show that these applications were the product of philosophical inexactitude and lack of precision in defining cause and effect.

Two causes and two effects may exist, where each of the two effects completes the cause of the other. When we are not careful in distinguishing the two causes it will appear as if the effect completes its own cause. Also, the effect becomes a cause of the availability of one of its conditions for existence. But the conditions for existence are other than the cause that produces that existence. For further clarification, see the discussion in Our Economy.

Contemporaneity between Cause and Effect

Since we now know that the existence of the effect is essentially linked to the existence of the cause, we can understand that the cause is necessary for the effect and that the effect must be contemporaneous with the cause, so that its being and existence will be linked to chat cause. Thus, it cannot exist after the non-existence of the cause or cannot continue after the cause discontinues. This is what we wish to express by 'the law of contemporaneity between the cause and the effect'. (p. 325)

Concerning this law, two arguments intended to prove that it is possible for the effect to continue after its cause discontinues were made. One of them was given by the theologians, .and the other by some modern mechanists

I. The Theological Argument

This argument rests on two ideas. The first is that coming into existence is the cause of the need of things for their causes. A thing needs a cause in order for it to come into existence. If it comes into existence, its existence after that will not require a cause. This is based on the theory of coming into existence (the falsehood of this theory was pointed out earlier). There, we learned that the need of a thing for a cause is not for the purpose of coming into existence, but because its existence is essentially linked to its specific cause.

The second is that the law of contemporaneity between the cause and the effect is not consistent with a certain group of phenomena in the universes pat disclose with clarity the continuity of the existence of the effect after the discontinuity of the cause. The high building erected by builders and constructed by the participation of thousands of workers continues to exist after the operation of building and construction is over, even when the workers depart from it and none of them remains alive.

Also, the car that is produced by a special factory with 'the help of technicians continues functioning, and may retain its mechanical system, even if that factory is destroyed and those technicians die. Again, the memoirs recorded by the hand of a certain person survive for hundreds of years after that person ceases to exist, revealing to others that person's life and history. These phenomena prove that the effect enjoys its freedom after it comes into existence and no longer needs its cause.

But in fact, giving these phenomena as illustrations that the effect is free from its cause after it comes into existence (p. 326) results from the lack of distinction between the cause and other things. If we understand the real cause of such phenomena - for example, the building of a house, the I construction of a] car system, and the writing of memoirs - we find that these

things do not dispense with their causes at any moment of their existence, and that every natural effect is destroyed as soon as it loses its cause.

What then is the effect of the employees' work to construct a house? It is the very operation of building. This operation is nothing but a number of motions made by the employees for the purpose of gathering raw material for construction, including brick iron, wood and similar things. These motions require the employees for their existence. Indeed, they definitely cease to exist at the time the employees cease to work.

The condition that occurs to the construction material as a result of the operation of construction is in its existence and continuity an effect of the properties of that material and of the general natural forces that impose on the matter the preservation of its condition and position. The same is true of the remaining examples.

Thus, the above-mentioned illusion disappears when we relate every effect to its cause, and no longer make an error with regard to the relation of the effects to their causes.

II. The Mechanical Opposition

This is the opposition raised by modern mechanics in light of the laws of mechanical motion posited by Galileo7 and Newton. On the basis of these laws, modern mechanics claimed chat if motion occurs due to a cause, it necessarily continues. Its continuity would not require a cause, contrary to the philosophical law already mentioned.

If we study this opposition carefully, we find that in fact it immediately leads to the cancellation of the principle of causality. This is because the reality of motion, as explained in earlier discussions, is just a change or substitution.

Therefore, it is a continuous coming into existence, i.e., a coming into existence linked to a coming into existence. Every one of its stages is anew coming into existence (p. 327) and a change following another change.

Thus, if it were possible for motion to continue without a cause, then it would be possible for is to occur without a cause, and for things to begin existing without a cause. The reason is that continuity of motion always involves a new coming into existence. Its dispensing with a cause means that the coming into existence also dispenses with a cause.

In order to clarify the inexplicability of this opposition from a scientific point of view, we must mention to the reader the law of essential powerlessness (qanun al-qusur adh-dhati) in modern mechanics on which this opposition rests.

Before Galileo, the common opinion concerning motion was that motion follows the moving force in the extent of continuity and existence. Thus, motion continues as long as the moving

force remains in existence. If this force is removed, the body comes to rest. Modern mechanics, however, posited a new law of motion.

The idea of this law is that bodies at rest or in motion remain at rest or in motion until they are subjugated to the influence of another force, which is great in relation to them and which forces them to change their state.

The scientific evidence of this law is the experiment which shows that if a mechanical system moving in a straight street with a specific force it isolated from the [external] moving force, it continues after chat to move with a certain measure of motion, before it comes to a full rest. It is possible to increase the length of this motion that occurs after the isolation of the system from the external moving force by polishing the parts of the system, repairing the road and reducing the external pressure. However, these things cannot do anything other than reduce the impediments in the way of motion, such as the stalling and so on.

Thus, if we are able to double these things that reduce the impediments, we will ensure the doubling of motion. If we suppose the removal of all impediments and the complete elimination of the external pressure, this would mean the endless continuity of (p. 328) motion in a specific speed.

One learns from this that if motion is produced in a body without being hampered by an external force that collides with it, it continues at a certain speed, even if the [external moving] force ceases. External forces affect the natural limit of the change of the speed, thus decreasing it or increasing it. For this reason, the degree of speed - with respect to intensity, weakness or slowness - depends on the external pressure which acts either in its direction or in the opposite direction. But the motion itself and its continuity in its natural speed do not depend on external factors.

Clearly, if this experiment is sound, it does not mean that effects continue without causes, nor is it incompatible with the above-mentioned philosophical law. The experiment does not make clear the real cause of motion, so that we can know whether that cause has discontinued while motion continues.

Those who have tried to use such an experiment as evidence for the falsehood of the philosophical law claimed that the real cause of motion is the external moving forces. Since the link of this force to motion was disrupted while, nevertheless, motion continued, this would show that motion continues after the discontinuity of its cause.

However, ,the experiment does not actually show that the external moving force is the real cause, so that they can draw this conclusion. Rather, it is possible that the real cause of motion is something that had existed all along. Muslim philosophers believe that accidental motions,

including the mechanical motion of a body, are all produced by a force within the same body. This force is the real moving force. External causes, on the other hand, act to activate this force and prepare it as a cause.

On the basis of this, the principle of substantial motion explained in an earlier chapter of this investigation was established. We do not wish at the present to exhaust this subject; rather, (p. 329) our purpose is to clarify that scientific experimentation on which the law of essential powerlessness was based is not incompatible with the laws of causality, nor does it prove the opposite of these laws.

III. Conclusion

In order for us to draw a conclusion, we need only to add to the above the law of finitude (qanun an-nih'ya). This law states that some of the causes that ascend philosophically proceed from some others that must have a beginning: that is; a first cause which does not proceed from a prior cause. The succession of causes cannot go on to infinity. This is because, as mentioned, every effect is nothing but a sort of relation or link to its cause. Therefore, all existing effects are links or relations. Links require an independent reality at which they stop. If there is no beginning to the chain of causes, all the parts of this chain will be effects. But if they are effects, they will be linked to other things. The question arises then as to what thing is it to which all these parts are linked. Put differently, if the chain of causes involves a cause not subject to the principle of causality and not in need of a cause, this would be the first cause which constitutes the beginning of the chain, since this cause does not proceed from another cause prior to it. If every existent in the chain, with no exception, requires a cause in accordance with the principle of causality, then ail existents would require a cause. But the question remains as to why this is so.

This necessary question is concerned with existence in general. We cannot rid ourselves of it except by supposing a first cause free from the principle of causality. With this, we attribute the existence of things to that first cause, without encountering the same question regarding why this cause exists. The reason is that this question is encountered with regard to the things that are subject to the principle of causality in particular. (p. 330)

Let us take boiling as an example. It is a natural phenomenon requiring a cause, in accordance with the principle of causality. We consider the warmth of water as its cause. Like boiling, this warmth requires a prior cause. If we take boiling and warmth as two parts of the chain of existence or of the succession of agents and causes, we find that it is necessary to add to this chain another part; for each of the two parts is in need of a cause.

Therefore, they require a third part. Also, the three parts together face the same problem. They need a cause of their existence, since every one of them is subject to the principle of causality. This is constantly and always the case with the chain of cause, even if it includes infinite parts. So, since every part of it requires a cause, the chain as a whole requires a cause. The question 'Why does it exist?' extends as far as the parts of the chain extend. No decisive answer to this question is possible, as long as the succession in the chain does not lead to a part that is self-sufficient and not requiring a cause, so that this part can put an end to the succession and give the chain its first eternal beginning.8

With this, we have gathered [evidence] sufficient for proving that this world proceeds from a being necessary in essence, self-sufficient and not requiring a cause. This is necessitated by the application of the principle of causality to the world, in accordance with the laws of causality mentioned earlier. If causality is a necessary principle of the universe, and if its infinite regress is impossible, it must, therefore, be applied to the universe in a comprehensive and ascending fashion, so that the universe can stop at a necessary first cause.

It is a good idea to point out at the end of this discussion a kind of material consideration (p. 331) that some modern writers give of the present issue for the purpose of refuting the first cause or the first agent. According to this consideration, the question about the first cause is nonsensical. The scientific or causal explanation always requires two terms, one of which is linked to the other -these being the cause and the effect, or the agent and the product. Therefore, the expression 'first cause' is a contradiction in terms, since the word 'cause' requires two terms, as we have seen, while the word 'first' requires one term. Thus, a cause cannot be both first and a cause at the same time. It is either first without being a cause or a cause without being first.

I do not know who told these writers that the word 'cause' requires a cause prior to it. It is true that the causal explanation always requires two terms, the cause and the effect, and it is also true that it is contradictory to think of a cause without an effect produced by it; otherwise, it would not be a cause but a sterile thing. Similarly, it is false to think of an effect without a cause. Each the cause and the effect requires the other next to it. However, the cause as a cause does not require a cause prior to it. Rather, it requires an effect.

Thus, both terms are available in the assumption of 'the first cause'. This is because the first cause has its effect which proceeds from it, and the effect has its first cause. The effect does not always require an effect that proceeds from it, for a phenomenon may proceed from a cause without a new thing proceeding from that phenomenon. Similarly, the cause does not require a cause prior to it. Rather, it requires an effect of itself.9

References

1. Werner Heisenberg, German philosopher and physicist (1901-76). Heisenberg won the Nobel Prize for physics in 1932. His most important contributions are in the area of quantum mechanics. He is known for the notion of 'uncertainty relations', which is also known as 'Heisenberg's principle of indetermincy'. According to this notion, microscopic things cannot be measured quantitatively by space-time coordinates. One cannot simultaneously specify the position and momentum of a particle. His principal writings arc: The Physical Principles of Quantum Theory and Physics and Philosophy.

2. Prince Louis-Victor de Broglie, French physicist (1892-). In 1929, he received the Nobel Prize for physics. He demonstrated that any particle is accompanied by a wave. Such a wave has a wave length that is inversely related to the momentum of the particle that depends on the mass and velocity of the particle.

3. Hadhih Hiya ad-Dialaktikiyya, p. 192.

4. Destouches, John-Louis.

5. Jabr wa-Ikhtiyar, p. 5.

6. For the purpose of clarification, review the discussion of historical materialism in the work Our Economy, by the author.

7. Galileo Galilei, Florentine astronomer (1564-1642). He studied falling bodies, and decided that the velocity of the fall of a body is not proportional to the body's weight, as Aristotle had taught. Rather, it is proportional w the time the fall takes.

His principal work is Dialogue concerning the Two Chief World Systems. In this work, the views of Ptolemy and Copernicus are expounded. Copernicus' views are presented in a more favorable light than those of Ptolemy.

8. In a precise philosophical phrase, a thing does not exist except if all the aspects of non-existence are impossible for it. Among all the aspects of non-existence, is the non-existence of a thing, due to the non-existence of all its causes. This aspect is not impossible except if a being necessary in itself is among all the causes of that thing.

9. Dr Muhammad 'Abd ar-Rahiman Marhaba, al-Mas'ala al-Falsafiyya, Manshurat 'Uwaydat, p. 80.