

**Ibadan Distance Learning Centre Series**

**PHI 308**  
**Philosophy of the Social**  
**Sciences**

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## **General Introduction and Course Objectives**

Many a times, most people conceive of philosophy as a discipline that is far removed from the concerns of daily life and of the philosopher as an intellectual generalist who preoccupies himself mostly with abstract ideas. This conception results from inadequate knowledge about what philosophy is and about what philosophers do. In a sense however, the philosopher is an intellectual generalist since the philosopher is interested not only in what goes on within and around him but also in the activities of other disciplines. As Prof. Kwasi Wiredu rightly puts it, the function of philosophy everywhere is to examine the intellectual foundations of life using the best available modes of knowledge and reflection on human well being. But as J. O. Sodipo rightly opines, this function of philosophy is not limited to social criticism alone, it involves also, the examination of the basic concepts, principles and theoretical foundations of other disciplines such as morals, religions, politics, law, history and the natural sciences. This present course interrogates the critical issues arising from philosophy's involvement with the social sciences. At the end of this course, students should be able to:

- i. Explain the involvement of philosophy with other disciplines;
- ii. Justify the relationship between philosophy and the natural and social sciences;
- iii. Examine some problems arising from the use of the scientific model of explanation in the social sciences and
- iv. Identify the most appropriate model of explanation for Science and the Social Sciences

## **LECTURE ONE**

### **Philosophy and Other Disciplines**

#### **Introduction**

There are four cardinal branches of philosophy, namely: metaphysics, epistemology, ethics and logic. Beyond these branches however, there are other areas of knowledge where philosophers and practitioners in these areas collaborate to discuss specific issues and problems which arise from such disciplines. In this lecture, we shall be looking at the relationship between philosophy and other disciplines. More specifically, we shall examine some justifications supporting the philosophers' involvement in other disciplines, most especially science and the social sciences

#### **Objectives**

At the end of this lecture, you will be able to:

1. Identify other areas of knowledge where philosophers collaborate with experts to discuss issues and problems arising from such areas;
2. Justify philosophy's involvement with science and the social sciences.

#### **Pre-test**

1. Name five disciplines where you think philosophy is relevant;
2. Isaac Newton was first a philosopher and then a scientist!  
Pythagoras was first a philosopher and then a mathematician!!  
Galileo was first a philosopher and then a scientist!!! What do these overlaps suggest to you?

## **CONTENT**

### **The Concern of Philosophy with Other Disciplines**

A general question likely to confront us in this course is: What is the concern of philosophy with other disciplines, most especially with science and more specifically with the social sciences? If the broad conception of science as anybody of knowledge is taken seriously, then philosophy and indeed other academic disciplines would count as science. However, philosophy as an academic discipline is not so much a system of accumulated knowledge claims as other disciplines are, rather, it is the critical study of the general problems which arise from the conventional beliefs, knowledge, claims as well as practices in other areas of knowledge. Consequent upon such study, philosophy proposes normative constructs by which these other disciplines are to be measured or evaluated.

Ordinarily, philosophy has its core areas like metaphysics- the study of what is; epistemology- the theory of knowledge; ethics- the study of morals and logic the study of regulative principles of reasoning, but the knowledge of these subjects and systems of philosophy equips the philosopher with the necessary principles and skills for raising and studying specific problems about other disciplines. Consequently, philosophy maintains a unique relationship with other disciplines. It serves as the interdisciplinary stand-point from which the logic and propriety of the methodological procedures of other disciplines are examined. It is for this reason that we have 'philosophy of X', where 'X' is an academic discipline other than philosophy. In this regard, we have:

Philosophy of Religion

Philosophy of Education

Philosophy of Law

Philosophy of History

Philosophy of Language

Philosophy of Mathematics

Philosophy of Science and

Philosophy of the Social Sciences amongst others.

These are areas in which philosophers and specialists in other disciplines collaborate to discuss specific problems which arise from the practices in a given discipline. The fundamental issue here however concerns how we can justify the involvement or interference of philosophy in the affairs of these various disciplines in question.

The first basic justification often provided by scholars is that many of these disciplines which today go by different nomenclatures actually arose out of philosophical questioning. For instance, Political Science, Economics, Sociology and Social Anthropology arose directly from Moral, Social and Political Philosophy [Raphael, 1976: 21]. The natural sciences were originally studied as part of Philosophy of Nature while Psychology was under Philosophy of Mind. And as the enterprise of philosophy grew and progressed, many new branches of knowledge were born and many new disciplines created. [Olu-Owolabi, 2011: 15] This historical relationship between philosophy and the various disciplines, many have argued, confers on Philosophy, the status of an “encompassing mother of all disciplines” whose duty it is to nurture and watch over these disciplines. It is in carrying out this duty that philosophy performs the following functions which themselves justify the involvement of philosophy in the affairs of the various disciplines:

1. Philosophy supplies the necessary logical and epistemological principles and techniques of criticism for appraising or re-examining the methods and procedures which are employed in other disciplines. This is because the principle and methods or techniques of philosophy have been rationally validated over the centuries.

2. Philosophy examines, using its techniques and principles, the methods and procedures of other disciplines, for their consistency and appropriateness in dealing with their specific subject matter. For example, in the social sciences, statistical, experimental or field research data are used as basis for explaining and predicting the behavior of individuals in society. A political scientist in explaining and predicting the political behavior of most Nigerians might do so in terms of certain characteristics of the Nigerian society which have been established through empirical research. Again the psychoanalyst might explain and predict the behavior of a neurotic patient in terms of the Oedipus complex hypothesis. In both examples, external laws which are methodically derived from research data but which are external to the individual are assumed to be responsible for the behavior of such individuals. This, for philosophers, is logically faulty and inappropriate, for, to explain individual behavior in terms of external laws and principles is to assume that individuals are controlled from without by external factors, thereby denying persons of their free will and the freedom to act as they deem fit.

3. Again, philosophy reveals the basic metaphysical presuppositions or assumptions of other disciplines in order to ascertain the nature and scope of knowledge claims which are made therein. By disclosing the basic assumptions of the various disciplines, philosophy helps to delimit the boundary and scope of operation of each discipline, thereby ensuring that no discipline unwittingly encroach on one another's subject-matter. In other words, philosophy functions as a guard or watchdog over the autonomy and mutual independence of the various disciplines.

4. Finally, Philosophy examines and draws out the interdisciplinary, moral, socio-political and cultural implications of the methods, the material products and knowledge claims of the various disciplines. For example, philosophers discuss the morality and cultural consequences of induced abortion, euthanasia, genetic engineering, in-vitro fertilisation as well as the mass production and stock-piling of arms and ammunitions. Though these developments derive from modern scientific progress, philosophy examines their tremendous impacts on other apparently unrelated spheres of human activities like morals, politics, religion, economy and cultural values. In fact, these developments constitute contemporary issues for discussion in philosophy, precisely in the area of ethics.

However, because our focus in this course is on social science as a variant of science, we should be more concerned with the involvement of philosophy with science generally and more specifically with the social sciences

### **The Concern of Philosophy with Science and the Social Sciences**

Until the mid-nineteenth century, there was no difference between philosophical inquiry and scientific investigation. In fact, science existed as natural philosophy. According to Russell L. Ackoff, “in the days when all scientists were philosophers and most philosophers were scientists, a great deal of attention were given to the way in which knowledge was acquired and justified” [Russell, 1962: 27]. Moritz Schlick, the leader of the Vienna Circle, also corroborates this point when he argued that the principles which are needed for the understanding of scientific inquires are philosophically derived and that they pertain to the branch of philosophy called Epistemology. According to Schlick, we can only understand scientific

inquires in their depth when we provide them with epistemological foundations [Miltong, 1981: 238]. This historical romance between philosophy and science explains the concern of philosophy interest with the scientific enterprise.

In expressing this concern, philosophy involves itself in conceptual analysis by defining concepts or problem areas in such a way as to make them susceptible to scientific study. Also, philosophy not only examines assumptions concerning the nature of reality which underlie science, it attempt to fuse the findings of the various branches of science into one consistent view of reality. In doing this, philosophy examines, not only the interrelations among the sciences but also the relation of the sciences with other aspects of civilization and culture.

Although the various sciences have their specific objects of investigation, a common methodological procedure is however discernable among the various specialised sciences. This procedure, by which conclusions and discoveries are alleged to be made in every science, is called the scientific method. Nevertheless, philosophers also raise methodological problems regarding the scientists' use of this method. How for instance can we say that the scientific method is rational and free from *apriori* metaphysical presuppositions? Even more worrisome is the problem of induction which is at the base of most laws guiding explanation in science. How for instance is the inductive method of drawing inferences to be justified? Following the principles of induction, to what extent can we say that scientific predictions are guaranteed by past experiences? Even the scientific practice of confirming and verifying hypotheses raises the question of how massive the supportive evidence for a hypothesis should be, in order for it to rank as a firm and an indubitable knowledge.

At another level, the philosopher raises the question of whether there is an ideal science to which all other sciences are approximations. For instance, the philosopher may want to know

whether all the sciences are governed by the same natural laws and theories, and whether the logic of explanation is the same for all the sciences or there are mutually independent modes of explanation. These issues are of serious concern to philosophers. Addressing them does not require any expertise in any or all of the sciences, what is needed is knowledge of the basic presuppositions and logical interrelations of the sciences and these, the philosopher possesses.

Let us conclude by looking at some reasons why philosophers are interested in the social sciences. Philosophers are interested in finding out whether there is actually a unity of method between the natural science and the social sciences. Otherwise, the question of which science will continue to stare us in the face. Philosophers are also interested in knowing the extent to which the assertion of science is able to guarantee some degree of certainty regarding the output of social science. Finally, philosophers are interested in the claims of the social sciences, most especially their use of the scientific method, given the fact that there are other means of justifying 'social scientific' claims that do not make explicit recourse to doctrines of science. This concern is important because as Alan Ryan rightly notes, "there is only one central methodological question about the social sciences, and that is whether they are sciences at all"[See: Ryan, 1981:8-33].

### **Summary**

So far in this lecture, we have examined the relationship between philosophy and other disciplines. We explained that there are other areas of knowledge where philosophers and practitioners in these areas collaborate to discuss specific issues and problems which arise from such areas. We concluded by examining some justifications supporting the philosophers' involvement in other disciplines, most especially science and the social sciences

### **Post-test**

1. Name at least five disciplines that philosophy maintains a unique relationship with.
2. Name three functions that philosophy performs towards other disciplines.
3. Give at least four reasons why philosophy is interested in science and the social sciences.

### **References**

1. Rapheal, D. D. 1976. *Problems of Philosophy*, London: Macmillan.
2. Kolawole Olu-Owolabi, 2011. *My People Perish for Lack of Philosophy*, Inaugural Lecture, Ibadan: University of Ibadan Press.
3. Russell L. Ackoff, Shiv K. Gupta and J. Sayer Minas, 1962. *Scientific Method, Optimizing Applied Research Decisions*, New York: John Wiley and Sons.
4. Milton K. Munitz, 1981. *Contemporary Analytic Philosophy*, New York: Macmillan.
5. Ryan Allan, 1981. "Is the Study of Society a Science" in Potter D. et. al, *Society and the Social Sciences*, London: Routledge and Kegan Paul.

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## **LECTURE TWO**

# **Relationship Between the Social Sciences and the Natural Sciences**

## **Introduction**

In this lecture, we shall be looking at the relationship between the natural sciences and the social sciences. Some scholars in these areas of discourse have always emphasised aspects where the two disciplines differ, thereby paying less attention to those areas where they corroborate and share ideas. This lecture will not only show areas where the two disciplines differ, as well as areas where they converge, it will in the process also show how philosophy interrogates these two apparently discordant disciplines.

## **Objectives**

At the end of this lecture, you will be able to:

1. Distinguish the natural sciences from the social sciences;
2. Show the relationship between philosophy and the natural sciences;  
and
3. Show the relationship between philosophy and the social sciences.

## **Pre-test**

1. Name five academic departments in the university where the natural sciences are studied.
2. Name five academic departments in the university where the social sciences are studied.
3. Can you sense any relationship among these ten departments? If yes, in what ways do you think they are related?

## **CONTENT**

## **Science and the Social Sciences**

Science is defined by Alan Chalmers as a collection of facts by means of careful observation and experiment, and the subsequent derivation of laws and theories from those facts by some kind of logical procedure [Chalmers, 1976: 7]. In strict conventional usage, the word science can be used to describe either the natural or pure sciences, the applied sciences or the social sciences. Natural science refers to those disciplines which make use of natural entities of the physical world as their object of study. It refers to the branch of human knowledge which attempts to study and understand these natural entities in order to be able predict certain phenomenon about our physical world [Ikporukpo, 2001: 1-11]. Examples of the natural sciences are Astronomy, Biology, Chemistry, Earth Sciences and Physics. Applied science refers to those disciplines dealing with the art of applying scientific knowledge to practical problems such as Medicine, Architecture, Engineering and Information Technology. The social sciences refer to those disciplines that study human society and institutions as well as the relationship of individual members within society. In other words, it is the science of social phenomena, whose focus is the social aspects of human experience. It is the aspect of human knowledge which attempts to understand general human behaviour in terms of his social, psychological and perhaps his economic environment, in order to be able to describe and explain such behaviours and as well as to also be able to predict such social phenomena, given certain conditions. Such disciplines include Sociology, Psychology, Anthropology, Geography, Economics, Political Science, and History.

Science or 'Natural Philosophy', as it was then called, was formally an aspect of philosophy until the Renaissance, when the enormous scientific knowledge produced facilitated the affirmation of science's own autonomy and distinct identity from philosophy [Derry, 1999: 9-10].

## **Philosophy of Science**

According to Rudolf Carnap, one of the eminent philosophers of

science in the twentieth century, philosophy of science is “the application of philosophical tools such as analysis, criticisms, conceptualisation, to scientific matters” [Carnap, 1967]. Philosophy of science strives to evaluate scientific knowledge by investigating the logic and reasoning behind scientific activities and discoveries [Popper, 1957]. In other words, philosophy of science is involved in the analysis and evaluation of science. For instance, philosophers of science have been concerned with the debate of the appropriate methodology to be used in carrying out scientific research.

Besides the methodological issue, philosophers of science have also been interested in the utility and morality of scientific knowledge and projects, the evaluation of scientific results and products, all with a view to seeing whether or not such knowledge, projects, results and products are in conflict with other important values. Philosophers of science are also interested in finding out the extent to which science can actually promote the welfare and civilisation of humanity without adversely affecting the rights and interests of human beings and other species of nature. For instance, the philosopher of science would reflect on the issue of whether scientific venture should be carried out to improve human lot, in spite of the recognition that such enterprise can adversely affect the environment and other means of survival of future generations and other beings inhabiting the eco-system. These and many other concerns constitute the subject-matter of what is called philosophy of science.

### **Philosophy of the Social Sciences**

The social science became a significant branch of intellectual study during the Enlightenment period. This is because it was an offshoot of the clamour for human interests and emancipation that characterised the new mode of thinking in the Enlightenment age. At its inception, the social science was greatly inspired by the logical positivists' position that the empirical method affects a perfect and objective study of all phenomena including the human person and the overall society in which he exists. Social science therefore developed as a result of this new tendency and the

underlying presumption that the scientific tool is appropriate and adequate for every intellectual project.

Philosophy of the social sciences, just like the philosophy of science, is out to study the various goals and methods of the social science, with the aim of evaluating whether the discipline is able to live up to the expectation of humanity. Philosophy of the social sciences ponders on certain issues inherited from the philosophy of natural science and also reflects on problems and issues generated by its own peculiar disciplinary orientation. For example, this area of philosophy reacts to the question of the appropriate methodology for the social scientific enterprise, which is an age long problem in philosophy of natural science. As R.S Rudner says, "the philosopher of social science is ranged with the philosopher of science in that both focus their attention on problems of methodology [Rudner, 1966].

Some of the central problems that philosophers of the social sciences address include (1) the extent to which one can say that human social life which the social sciences claim to study is, or is not similar to non-human nature which is studied by the natural science; (2) the extent to which human and social experiences can be explainable by using the scientific method; (3) the extent to which the results and findings of the social scientists can be used to predict and control future occurrences in the social world in the same way in which findings in the natural sciences are used to predict and control occurrences in the natural world; (4) the extent of to which the themes, logic and the method of the social science are distinctively peculiar as basis for differentiating the social science from the humanities and for associating the social science with the natural science and (4) the extent to which we can reduce human actions to scientific paradigm which is capable of fulfilling the four goals of science, described by Keith Webb as prediction, explanation, control, and understanding [See: Nelson, 2007: 261-268 and Webb, 1995: 80-103].

## **Differences Between the Social Sciences and the Natural Sciences**

During the early stages of the development of the social sciences,

there were many varied and conflicting beliefs about the relation between them and the natural sciences. On the one hand, we have those who believe that no science of anything social is possible or desirable. On the other hand we have those who find nothing repugnant in bringing exactness, rigorous formulation, analysis and all the rest which goes with science, to bear on social inquiry. At this level of study, it is however safer for us to avoid pursuing any of these positions to the extreme. Although the social sciences claim to study human society and institutions as well as the relationship of individual members within society in a scientific manner, it has however been ascertained that there are fundamental differences between the social sciences and the natural sciences whose method, the social sciences claim to employ. Such differences can be seen in the following areas.

First is in the area of their objects of study or investigation. The natural sciences are concerned mostly with inanimate objects in the natural world, and when they study man and other non human animals, they are concerned mostly with the physiological and non psychological components of such studies. On the other hand, the social sciences study the socio-cultural, psychological, anthropological and economic dimensions of man and the society in which he lives. And so, while the natural sciences aim to understand and be able to explain, describe, or predict the natural phenomenon of the physical world, the social sciences on the other hand, strives to understand and be able to explain, describe or predict the cultural, social, political or economic behavior of human beings [Haider and Morford, 2004: 1-8].

Another difference between the natural sciences and the social sciences can be seen in the way they deal with their objects of study. Since the social sciences deal with man and other man-made institutions and phenomena, it will be impossible to confine such to certain conditions of regularity or conformity or to confine them to laboratories for the purpose of study, observation or experimentation. This is because humans are sentient beings with volitions and freewill, who act on the basis of intentions, reasons and even emotions. On the other hand, the objects of study in the

natural sciences, being inanimate objects can be subjected to certain conditions of regularity or conformity or be confined to laboratories for the purpose of study, observation or experimentation. Even in cases where the natural sciences study animals, it is still possible to subject such to certain specified conditions.

Finally, another area of difference is in their ultimate objectives and purposes of study. While the ultimate objective of the natural sciences in most cases, is usually to understand the natural world better, with the purpose of controlling, subduing and predicting events and occurrences in nature, the objective of the social sciences on the other hand is to understand man better, with the purpose of helping him adapt to the challenges of his dynamic nature and environment.

### **Similarities Between the Social Sciences and the Natural Sciences**

Given the differences enumerated above between the natural and social sciences, the tendency will be to conclude that the two disciplines are poles apart. This however is not the case as there are areas where the two disciplines corroborate and share ideas.

In the first place, the fact that the two disciplines share the word 'science', which in its Latin origin means 'to know', shows that they are both in search of a certain kind of knowledge. Both the natural and the social sciences have the objective of studying phenomena, for the purpose of understanding, in order to be able to describe, explain and where necessary, predict future occurrences. The natural science strives to study and understand objects in nature so as to be able to describe, explain and predict natural occurrences, events, happenings or phenomena. The social sciences on the other hand, also try to understand general human behaviour in its social, cultural, psychological and perhaps economic dimensions, in order to be able to describe, explain and where necessary predict future socio-cultural occurrences and behavior of man.

Again, both disciplines have in focus, concrete objects of study and not just some abstract, metaphysical or rarefied entities. The objects of study of the social sciences are social institutions, human beings and societies. The natural sciences study concrete objects or events in the natural world. So both disciplines have as their objects of observation, specific concrete phenomena [Keonman, 2004].

For some, a relationship of the two enterprises of natural and social sciences exist at birth, since according to them, the social science was born at the time when philosophy was given an empirical plinth by the natural sciences, that is, when the natural scientists started emphasising the importance of observation, statistics, experimentation, mathematical rigor and so on as crucial components of the philosophical method of investigation.

Furthermore, a relationship between the natural and social sciences can be seen in the area of theories of explanation shared by the two disciplines. For instance, Chaos Theory is a field of study in Mathematics which studies the behaviour of dynamical systems that are highly sensitive to initial conditions. Primarily, this theory was strictly used in Mathematics, Physics, and the natural sciences in general, but now, it is also employed in the social sciences [Kellert, 1993: 32]. In the same vein, Network Theory, used computer science, physics and network science, which concerns itself with the study of graphs as a representation of either symmetric relations or more generally, of asymmetric relations between discrete objects, is now being employed as social network theory in the social science [Network Theory, 2011].

Also, the Systems Theory which swept through the natural sciences in the 1960s with cybernetics, is now being employed by the social scientists, especially in their study of societies, which they conceive also as systems. This is especially exemplified in the works of two sociologists, Talcott Parson's *Action Theory* and Niklas Luhman's *Systems Theory*. Furthermore, Neuroscience, which was originally devoted to the scientific study of the brain has now been appropriated by psychologists, sociologists and even economists [Olutayo, 2001: 138-149]. Finally, Functionalism is a theory of

explanation used in Physics, Logic and Mathematic as a way of correlating variables, and for studying biological organisms and systems in Biology. This theory of explanation is also used by the social sciences in their study of society on grounds of their observed similarities between biological organisms and societies.

### **Summary**

In this lecture, we have explained the meaning of natural science and social science and the ways philosophy is involved with both disciplines. We also examined the relationship between the natural sciences and the social sciences by looking at their differences and similarities. This became necessary because some scholars in these areas of discourse have always emphasised aspects where the two disciplines differ, thereby paying less attention to those areas where they corroborate and share ideas.

### **Post-test**

4. What is science and what is social science?
5. What are the subject-matters of philosophy of science and philosophy of the social sciences?
6. Name three differences and three similarities between natural science and social science.

## References

1. Alan Chalmers. 1976. *What is This Thing called Science?* 2<sup>nd</sup> edition. Queensland University Press.
2. Chris O. Ikporukpo. 2001. "The Object and Nature of Social Sciences" in Chris O. Ikporukpo (Ed.) *Government, Society and Economy*. Ibadan: Sterlin Horden Publishers.
3. Gregory N Derry. *What Science is and How it Works*. New Jersey: Princeton University Press. 1999.
4. Rudolf Carnap. 1967. *The Logical Structure of the World and Pseudo problems in Philosophy*. Routledge & K. Paul.
5. Karl Popper. 1959. *The Logic of Scientific Discovery*. Routledge Classics.
6. R.S. Ruder. 1966. *Philosophy of Social Science*. New Jersey: Prentice Hall.
7. Julie A. Nelson. 2007. "Is Economics a Natural Science" in *Cosmos and History: The Journal of Natural and Social Philosophy*. Vol. I. NO.2.
8. Keith Webb. 1995. *An Introduction to Problems in the Philosophy of Social Sciences*. London: Printer.
9. Wolfgang Haider & Shawn Morford. 2004. "Relevance of Social Science to the Management of Natural Resources in British Columbia" in *BC Journal of Ecosystems and Management*. Vol. 4. No. 1.
10. Keonman78, March 2004 "Similarities and Differences Between Social Science and Natural Science". Retrieved on 29 Sept. 2011 from <http://www.writework.com/essay/similarities-and-differences-between-social-science-and-na>
11. Stephen H Kellert. 1993. *In the wake of Chaos: Unpredictable Order in Dynamical Systems*. Chicago: University of Chicago Press.
12. Network Theory. Available at: [http://en.wikipedia.org/wiki/Network\\_theory](http://en.wikipedia.org/wiki/Network_theory). Assessed on 22nd September 2011.
13. A.O. Olutayo. 2001. "The Subject Matter and Scope of Sociology" in Chris O. Ikporukpo (Ed.) *Government, Society and Economy*. Ibadan: Sterlin Horden Publishers.

## **LECTURE THREE**

### **The Scientific Enterprise**

#### **Introduction**

In this lecture, we shall be looking at meaning, features, method and aims of science. In contemporary discourse, the discipline of science has been viewed broadly under three distinct categories. These are the natural or pure sciences, the applied sciences and the social sciences. In the strict, conventional sense however, the word science is employed to signify the natural or pure sciences. Science so described has certain features. (i) It is objective, (ii) It is impersonal; (iii) It is specific and (iv) It is public in character.

#### **Objectives**

At the end of this lecture, you will be able to:

1. Distinguish between science in the broad/general sense and science in the strict conventional sense and
2. Identify those features that are the hallmarks of science.

#### **Pre-test**

3. How would you define science?
4. Name two features of science so defined and explain them

### **CONTENT**

#### **Meaning of Science**

In the *Chambers Twentieth Century Dictionary*, science is defined as any systematized, organized or classified body of knowledge which has been critically tested and is beyond reasonable doubt. The English word 'science' derives originally from the Latin noun 'scientia' which has its root in the Latin verb 'scire' meaning, to know. This broad understanding of science as

any body of systematised knowledge makes every academic discipline to count as science. This is the reason Ernesto Grassi in his *The Origin and the Limits of Moral and Natural Sciences*, described such disciplines as History, Religion, Law, Linguistic and even Philosophy, as science [Popper, 1963]. Robert Morgan, in his *Science and Technology for Development, The Role of US Universities*, corroborated this view when he described science as any activity resulting in knowledge and understanding about the world around us [Morgan, 1979: xviii].

The foregoing broad conception of science notwithstanding, in contemporary discourse, the discipline of science has been viewed broadly under three distinct categories. These are the natural or pure sciences, the applied sciences and the social sciences. The natural sciences include Astronomy, Biology, Chemistry, Earth Sciences and Physics. These sciences study natural phenomena. In other words, they deal with the properties and behavior patterns of natural objects. The applied sciences include Architecture, Medicine, Engineering and Information Technology. This branch of science is described by Robert Morgan as “an activity resulting in procedures for building and creating things in prototypes and models of products, in gadgets and inventions.” The ultimate goal of the applied sciences is, to be able to control the course of events and enhance man’s comfort and happiness on earth by inventing more and more technological facilities. The social sciences deal with the behavior and interaction of persons by appealing to our knowledge of the social institutions and the relatively recurrent cultural practices, which give meaning to these behavior and interactions in the society. Among the social sciences are Economics, Sociology, Psychology, Political Science, Anthropology and Geography.

In the strict, conventional sense however, the word science is employed to signify the natural or pure sciences. It is this understanding of science that informed S.P. Gueye’s definition of science is the “specific modality of human activity investment which consists of producing objective knowledge based on the discovering of laws in the various areas of reality enabling us to give a rational account and an extremely good anticipation of

events and phenomena” [Gueye, 1995: 8]. Science so conceived has four distinct characteristics associated with it [Aigbodioh, 1997: 3-5].

## **Features of Science**

### **1. Science is Specific**

By this, we mean that science deals with particular, observable or identifiable objects of this terrestrial world, rather than with some abstract general ideas or beings. Again, it means that science provides us with information about our world as it actually is. This is the reason the natural sciences are sometimes referred to as the ‘exact sciences’

### **2. Science is Public in Character**

By this, we mean that the techniques and methods, as well as findings and products of science, are not understandable only to a select few, but are capable of being communicated and taught to the generality of persons. For this reason, the conclusions and knowledge claims in the sciences are not only interpersonally verifiable, but are also open to public scrutiny.

### **3. Science is Impersonal**

By this, we mean that science does not involve beliefs or ideals which result from a person’s peculiar power of imagination; that science is dispassionate and unprejudiced and that science does not admit of value judgments or arbitrary preferences, as choices are made strictly in accordance with scientific techniques and methods which are objective in character.

### **4. Science is Objective**

By this, we mean that the concepts, laws and theories of science are drawn from the hard and naked facts about the world of everyday perceptual experience. In other words, the objectivity of science derives from the fact that pure facts form the bedrock of scientific theories and discoveries. In this wise, laws and theories in science are taken as valid irrespective of human expectations, attitudes and wishes.

The above features of science distinguish scientific knowledge from ideologies, beliefs, metaphysics and religious articles of faith and they confer on science, the power to uncover the truth about the world as it actually is.

This is the reason the emphasis today is on science, with the prevailing assumption that every problem, personal and social as well as natural and technological should be amenable to solution by the application of the method of science [Offor, 1999:155]. It is this present assumption that informs the decision by many other disciplines to employ the scientific method in their investigations. But first, what is the Scientific Method?

### **The Scientific Method**

The scientific method refers to the general procedures of carrying out research in the natural sciences. It has to do with the set of rules, norms and criteria governing all the operations and procedures needed to develop a scientific theory and establish a scientific law. As a method of research, the scientific method is said to be identified with a number of procedural stages or steps, although scholars are not generally unanimous about the exact number of research stages in the scientific method. Ackoff for example, identifies observation, generalization and experimentation as the three traditional phases of scientific research [Aigbodioh, 1997: 24], while Hempel suggests a four-stage process of scientific research [Hempel, 1970].

Roughly and briefly, we may present the scientific method schematically in this way:

- (1) Observation of a problem
- (2) Formulation of hypothesis
- (3) Verification by experience
- (4) Confirmation of hypothesis
- (5) Formulation of scientific laws

Once a scientific law is formulated, it is then possible to explain and predict future occurrences on the strength of such law.

### **Aims of Science**

So far, we have looked at the meaning, features and the method of science. What then can we consider to be the aim or aims of science so conceived? In his *The Rationality of Scientific Discovering*, Nicholas Maxwell

affirms that “the aim of science is simply to discover more and more facts about the world or about the phenomena under investigation, whatever the world or phenomena under investigation, whatever the world or the phenomena may turn out to be like” [Maxwell, 1974: 124]. Here, science is said to be pursued for its own sake, in order to increase our understanding of the world around us. This view has been criticised on the grounds that it divorces science from the practical needs of human beings who see in science, a means of improving their existential condition.

Another view is that the aims of science should be conceived in terms of its utilitarian values. From this perspective, science is not pursued for the sake of the knowledge it gives, but for its economic and technological values or benefits.

A third view which is common to Einstein is that the ultimate goal of science is to explain the world and its phenomena by establishing certain observed regularities about them and conceptualizing or expressing such regularities in the form of hypotheses, laws and theories which would enable us predict future occurrences. The basic assumption here is that the universe is simple, harmoniously united, orderly and beautiful in itself, but that the scientists seek how best to understand the world in these terms.

Although this view has gained popular acceptance among scholars, it cannot however be said to express the complete aim or aims of science, since scientific practices and results are not usually affected by whatever views are held by individual scientists, regarding the ultimate goal of science. It is therefore more plausible to consider a more eclectic approach to the question of the aim of science; an approach that will incorporate all the views so far expressed by various scholars on the question of the aim of science. This can be better achieved by looking at what scientists actually do, rather than what some people believe they do. Scientific activities are readily characterised as acts of explaining, understanding, predicting or describing the occurrences and processes of natural events and phenomena, and where necessary, inventing, for the purpose of improving existential human condition. This is what G.S. Sogolo means, when he says that science is both theoretically and practically motivated.

## Summary

In this lecture, we have distinguished between science in the broad sense and science in the strict conventional sense. We examined certain features which are today seen as the hallmarks of science, which are that (i) science is objective, (ii) science is impersonal; (iii) science is specific and (iv) science is public in character. We then examined the views of philosophers on what they consider to be the aim or aims of science so conceived, but concluded that each philosopher's view only reflects part of what the aims of science should be, since scientific practices and results are not usually affected by whatever views are held by individual scientists, regarding the ultimate goal of science. We then suggested an eclectic approach that will incorporate the views so far expressed by various scholars on the question of the aim of science.

## Post-test

1. What is science?
2. What do we mean when we say that science is objective, impersonal, specific and public in character?
3. Examine the views of Nicholas Maxwell, Einstein and G. S. Sogolo on the aims of science. Who among these scholars do you think gives a more satisfactory answer to the question of the aims of science?

## References

1. Karl R. Popper. 1963. *Conjectures and Refutations: The Growth of Scientific Knowledge*. New York: Harper and Row.
2. Robert P. Morgan et.al. 1979. *Science and Technology for Development: The Role of US Universities*. New York: Pergamon Press.
3. G. P. Gueye. 1995. CODESRIA Bulletin, Number 2.
4. Jack A. Aigbodioh. 1997. *Philosophy of Science: Issues and Problems*. Ibadan: Hope Publications.
5. Francis Ofor. 1999. The Issue of Method in the Philosophy of the Social Sciences. Dipo Irele (ed.) *Philosophy, Logic and Scientific Reasoning*. Ibadan: Hew Horn.
6. Carl G. Hempel. 1970. *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science*. New York: The Free Press.
7. Nicholas Maxwell. 1974. The Rationality of Scientific Discovery, Part 1: The Traditional Rationality Problem. *Philosophy of Science*. Vol. 41. No. 2.

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## **LECTURE FOUR**

### **Explanation in Science**

#### **Introduction**

Explanation permeates every intellectual enterprise, as there is practically no human discipline which does not employ explanation of some sorts. Science as an intellectual endeavour is arguably a product of the human curiosity to understand the self, others and the environment. In order to fulfill this quest, scientists, over the years have developed some models of explanation. In this lecture, which shall be looking at the various senses of the term 'explanation', the formalists and contextualists approaches to explanation and the limits of scientific explanation.

#### **Objectives**

At the end of this lecture, you will be able to:

1. Explain the various senses of the term explanation
2. Distinguish between the formalists and contextualists approaches to scientific explanation.

#### **Pre-test**

1. Attempt a definition of the term 'explanation'.
2. Do you think the term can be used in more than one sense?
3. Are explanations fool-proof or there can be limits to the extent to which an explanation can go?

## **CONTENT**

### **The Concept of Explanation**

Etymologically, the term 'explanation' is derived from the Latin word *explanare*. The term was introduced into the English diction in the 15<sup>th</sup> century. Generally speaking, explanation is the response which often succeed questions of How? Why? What? When? The term is as old as human linguistic expression, and some linguists have even argued that it is a major

factor responsible for the introduction of language. An explanation is an act, process or procedure of making an object of discourse, be it a concept, an idea or an event, intelligibly understandable. It aims at offering a general framework to an analysis in such a way that reduces the unfamiliar to the familiar. There is no human enterprise that is devoid of explanation and science is not an exception.

## **Senses of Explanation**

Various senses of the term explanation can be identified, but for the purpose of this lecture, we shall examine four basic senses of explanation.

### **Explanation with Reasons**

This form of explanation often attempts to answer the why(?) question. Questions such as why many people believe in God and worship God and why people go to church or worship in shrines or mosque. For these questions, various explanations are possible. The Marxist would say that religion is the opium of the people, the Freudian or the psychoanalyst would say that the childhood sense of dependence, or desire for protection and parental care and love manifests itself in the people's creation of an all-good and omnipotent God who will provide all their human needs. Under any of these assumptions it could be explained that many people believe in God or worship Him because they are economically poor or are psychologically in quest for God-father, who will deliver them from fear and hardship. The reasons behind an explanation could either be manifest or latent. According to Jack Aigbodioh:

In these explanatory bid, the reason(s) which are supposed responsible for why certain beliefs are held are such that the individual believer could either be conscious (aware of them) or not. If the believer is conscious of them, then they are manifest and can be stated explicitly by the believer, but if not, then the reasons are said to be latent, for the reason that they can only be discovered by investigating the primitive factors which underlie the belief or behaviour in question [Aigbodioh 1997: 78].

This sense of explanation is more prevalent in the explanation of events

involving human-social phenomena and institutions.

## **Purposive Explanations**

The purposive sense of explanation is similar to the explanation with reasons discussed above. The only difference is that in the purposive sense, explanation is given as to why an extra-ordinary or special action is taken, rather than the expected, and the reason for this is mostly internally determined by the subject. For instance, why would a man travel fifty countries in the world via road, instead of going by air? It might be that he wanted to make history, or he wanted to confirm the ruggedness, durability, and strength of a vehicle. Often time, the prime actors in a purposive sense of explanation are psychologically or socio-economically disposed to act the very way they did. This distinction between explanation with reasons and purposive explanation is well laid out below by John Hospers:

There is a fundamental point of distinction between explanations by reference to reasons and purposive explanations. In the latter case, the goals (reasons) which are imputed to the persons (for making an event happen) are generally consciously entertained, whereas in the former case the reasons need not be. Nevertheless, both sorts of explanation are common in the social sciences and in history, and they are classified under functional or Teleological explanations [Hospers 1946: 23].

## **Explanation as a Reductive Activity**

The rationale behind this form of explanation is to reduce a seemingly enigmatic experience, idea, event or concept, to a relatively more familiar one, and by so doing, the former is better explained and understood. For instance, the *strange*(?) behaviour of Reverend Fathers who do not marry may be bizarre to many, until it is explained as an act of celibacy, which will give better understanding of the experience in question. Similarly, when a once lovely wife turns an attempted murderer on her lover, this event may remain eccentric and absurd until it is understood that she was acting under the influence of anger, jealousy or a related emotional displacement. In this sense, what appears to be a strange or weird form of behaviour is explained away in familiar terms as a true experience which results from such feelings, motives and desires as we often have [Aigbodioh 1997: 81]. By so doing, that is, “by tracing a relation between the unfamiliar changes and the extremely familiar changes”, we are according to Anthony Flew, “rendering the former more intelligible; we are explaining them” [Flew 1960: 101]. This sense of explanation is more prominent in the enterprise of science. For instance, when asked why balloons rise up in the air rather than descend, a scientific explanation will show that balloons contain gas which is of lower weight than the normal atmospheric condition.

## **Explanation by Subsumption under Laws.**

The idea of law as used in this context is wide, as it entails more than natural laws. In this sense, explanation which appeals to reasons, motives and desires are held to be ideally explained by subsuming them under general laws. John Hospers aptly clarifies this when he writes that:

To explain an event is simply to bring it under a law; and to explain a law is to bring it under another law. It does not matter whether the law is one about purposes or not; what matters is that if the explanation is true ... the law invoked must be true [Hospers 1946: 29]

This sense of explanation is of commonly found in the sciences. For instance, the questions of why ice float on water or why short parents give birth to short children or why fart smells beyond its spot of release or why plastic is an insulator of electricity or why water and oil do not mix and many more, are better explained in the sciences by subsuming them under laws.

## **The Formalist and Contextualist Approaches to Scientific Explanation**

Philosophy of science in recent times, acknowledges the controversy between the Formalist and the Contextualist schools, which largely borders on how best scientific theories, explanatory and predictive powers should be construed. Thus, the basic concerns of the schools may be presented in this question form: Are there universalisable formal structure or logical forms into which all scientific theories are analyzable? According to the formalists as represented by Carl Hempel, Ernest Nagel, Wesley Salmon, and Mary Hesse, every scientific theory, as well as the way it serves the purpose of explanation, can be analyzed into a definite logical structure. The contextualists, represented by scholars like N.K. Hanson, Thomas Kuhn, Michael Scriven and Stephen Toulmin argue on the other hand, that there are no logical models into which scientific theories and explanation may be analysed. Instead, the contextualists insist that if we must genuinely assimilate the meaning of scientific theories, we must take into account the intentions, motives, desires and aspirations of the scientists.

## **The Limits of Scientific Explanation**

In this latter part of the lecture, we shall attempt to answer the question of whether science actually explains in the true sense of the word and whether indeed, science can explain the whole of reality.

Science as an empirical enterprise is concerned with the explanation of physical phenomenon or matter in general. In doing this, science basically answers questions regarding the 'What' and 'How' of things. However, the 'Why' questions are regarded as religious, moralistic, metaphysical and non-

scientific, and so outside the purview of science. Therefore, science becomes incapacitated in explaining to mankind, why for instance, humans and animals exist, and why an event occurs as against its non-occurrence. Since, the natural sciences with all their observational and experimental methods are hopelessly handicapped in providing us with ultimate and logical answers to these and many like questions, they cannot be said without equivocation, to explain in the real sense of the world.

Again, scientific explanation is limited only to the perceptible aspect of the object or event to be explained, thereby leaving out those imperceptible aspects which to many philosophers, are the very essence of any explanation. Scientific explanation therefore may not be successful in its explanatory bid in as much as the essences of the issues, concepts, materials and mechanism it strives to explain remained unraveled. In the words of E. W. Hobson, "natural science describes so far as it can, how, or in accordance with what rules, phenomenon happen, but it is wholly incompetent to answer the question of why they happen; which relates to the essences of the events" [Hobson 1976:46].

It should be noted also that science in recent times has been facing some catastrophic challenges in its business of explanation even within the confine of its empirical laws and axioms. Science for instance has not been able to explain the operational system of the UFOs- unidentified flying objects. Though, one may be accused of committing the fallacy of hasty generalization or that of ignorance, as scientific experiments in the future may unfold this mystery, but in the light of today's findings, science is to provide a satisfactory explanation of that phenomenon.

The implication of the foregoing is that explanation could be attained in different ways and that scientific explanation is one out of many alternative modes of explanation. Hence, "the scientific model which was initially put forward as the way or the method must now be admitted as a single way or method out of others" [Broody 1970: 125].

## Summary

So far in this lecture, we have looked at the meaning of explanation as well as the various senses of the term 'explanation'. These are explanation with reasons, purposive explanations, explanation as a reductive activity and explanation by subsumption under laws. We also examined the formalists and contextualists approaches to scientific explanation. Whereas the formalists argue that every scientific theory, as well as the way it serves the purpose of explanation, can be analyzed into a definite logical structure, the contextualists insist that there are no logical models into which scientific theories and explanation may be analysed. We concluded by looking at the limits of scientific explanation.

## Post-test

1. What is explanation?
2. Name at least three different senses of the term explanation.
3. Briefly discuss the views of the formalists and the conceptualists on scientific explanation.
4. What would you consider to be the limits of scientific explanation.

## References

1. Aigbodioh J. 1997. *Philosophy of Science: Issues and Problems*. Ibadan: Hope Publication.
2. Hospers J. 1946. What is Explanation? *Journal of Philosophy*, Volume II.
3. Flew A. 1960. *Essays in conceptual Analysis*. London: Macmillan & Company Ltd.
4. See: Hanson R. 1960. *Pattern of Discovery*. London: Cambridge University Press and Palmer S. 1957. *Social Theory and Social System*. Indianapolis: Free Press Ltd.
5. Broody B. 1970. *Readings in the Philosophy of Science*, New Jersey. Prentice Hall Incorporation.

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## **LECTURE FIVE**

### **The Problem of Induction**

#### **Introduction**

Induction is a form of reasoning that makes progression from particular individual instances to wider generalisations. It is the method of arriving at some generalisations from observation and experimentation of some particular instances. In this lecture, we shall look at the meaning of induction, examine the problem of induction and then conclude with an attempted justification of induction.

#### **Objectives**

At the end of this lecture, you will be able to:

1. Define induction;
2. Distinguish inductive reasoning from other forms of reasoning; and
3. Show the relationship between induction and universal laws of explanation.

#### **Pre-test**

1. If there are fifty oranges in a basket and forty-five of them are shown to be ripe, would on the basis of this information conclude that all the oranges in the basket are ripe? Give reasons for your answer.
2. Consider the following two arguments:
  - i. All humans are mortal  
Aristotle is human  
Therefore Aristotle is mortal
  - ii. John is human and is mortal  
Peter is human and is mortal  
James is human and is mortal  
Therefore, all humans are mortal

For which of these arguments do you think the reasons are good enough for accepting their conclusions? Justify your answer.

## **CONTENT**

### **The Meaning of Induction**

Induction is a form of reasoning that makes progression from particular individual instances to wider generalisations. Put differently, it is the method of arriving at some generalisations from observation of and experimentation with some particular instances. C.S. Pierce defines induction as “where we generalise from a number of cases of which something is true and infer that the same thing is true of a whole class” [Pierce, 1957: 129].

Inductive reasoning may be categorised into three types namely:

1. Imperfect Induction
2. Intuitive Induction and
3. Perfect Induction

Imperfect induction is a generic term that describes any form of induction based upon an incomplete enumeration of instances. The imperfect induction comprises the following:

- a. Induction by Simple Enumeration
- b. Analogical Induction and
- c. Eliminative Induction

Induction by simple enumeration is nothing more than an empirical generalisation. That is, when we, from one or more instances of observed events, generalise or argue to a proposition that applies universally to all such instances. Analogical induction proceeds from a given particular to another particular. It emphasises uniformity and correspondence between particular instances. Eliminative induction was propounded by Francis Bacon, who saw the induction by simple enumeration as a false scientific procedure. According to Bacon, eliminative induction analyzes nature by proper rejections and exclusions and then, after a sufficient number of negatives, comes to a conclusion on the affirmative instances.

The second type of inductive reasoning - Intuitive Induction is more concerned with having an intuitive insight into the truth of a universal,

than making attempts to establish it as a generalisation. The third type is the perfect induction in which the inductive process is perfected by citing every possible instance that might bear on the formulation of a universal proposition.

### **The Problem of Induction**

The problem of induction is the philosophical question of whether inductive reasoning leads to knowledge. It calls into question the justification for (a) generalising about the properties of a class of objects based on some number of observations of particular instances of that class and (b) presupposing that a sequence of events in the future will occur as it always had in the past. David Hume calls this, 'The Principle of Uniformity of Nature' [Hume, 1975]. The problem of induction calls into question all empirical claims made in everyday life or through scientific method. It is for this reason that C.D. Broad describes induction as "the glory of science and the scandal of Philosophy" [See: Wales, 2011] Although the problem of induction dates back to the time of Pyrrho of Elis who lived in the ancient period, it was David Hume who introduced the problem more vociferously in the mid-18th century, with the most notable responses coming from philosophers like Bertrand Russell, Nelson Goodman and Karl Popper amongst others. It behooves on us therefore to examine David Hume's and some of these other ideas on the problem of induction.

### **David Hume on Induction**

David Hume's discussion of the problem of induction is laid out in his famous work entitled *Enquiry Concerning Human Understanding*. In this work, Hume argues that we do not indeed make inductive inferences, in the experimental sciences and in our daily lives, from events of our past experience to the effect that if events resembling those of our past experience were to occur now or in the future, then they will produce effects resembling those of the past [Hume, 1975: 36-37]. According to Hume, we cannot use past experience to assert that future occurrences which are yet unobserved and may never be observed would resemble those of the past. If this is so, Hume asks: "what is the foundation of all our conclusions from

experience?”

Hume argues that there are no justified logical grounds for drawing futuristic conclusions from past experiences because such inference is neither intuitive nor demonstrative [Aigbodioh, 1999: 151]. If according to Hume if we insist on justifying our inference on the basis of experience, then we would be open to two main objections: The first is that it would lead us inexorably either to a circulatory or infinite regress argument. Second is that since all such inferences from experience suppose, as their foundation, that the future will resemble the past, it supposes also that similar powers will be conjoined with similar sensible qualities. All of these, Hume argues, are in need of logical justification. Hume expresses his anxiety in his *Enquiry Concerning Human Understanding* thus:

If there be any suspicion that the course of nature may change, and that the past may be no rule for the future, all experience becomes useless, and can give rise to no inference or conclusion. It is impossible therefore, that any argument from experience can prove this resemblance of the past to the future since all these arguments are founded on the supposition of that resemblance [Hume, 1975: 37-38].

The point being made by Hume, as recapitulated by Jack Aigbodion, is that the inductive derivation of natural laws and scientific theories from a number of singular observations and experiments is inconclusive and questionable [Aigbodioh, 1999: 152]. Hume's conclusion is that because of the experiences of constant conjunction of events and objects over a long period of time, we have been habitually conditioned to expect one, on the appearance of the other.

### **Bertrand Russell and Karl Popper on Induction**

In his book *The Problems of Philosophy*, Bertrand Russell argues like Hume, that there are no justifiable reasons on which to hinge the reliability of induction. Russell wonders how “any number of cases of a law being fulfilled in the past affords evidence that it will be fulfilled in the future” [Russell, 1985: 34].

He argue that we only we only justify our belief that the future will resemble the past by reference to how past uniform succession or co-existence have caused our expectations of similar uniform successions or co-existences. But such expectations he argued are in no way justifiable on any rational or logical grounds.

In his *The Logic of Scientific Discovery*, Karl Popper argues, just like Hume and Russell, that there can be no valid arguments allowing us to establish that those instances of which we have had experiences resemble those of which we shall have experience. While responding to the view supported by some, that scientific truths, laws and theories are the results of inductive inferences, Karl Popper argues that induction is irrelevant to scientific procedure. According to Popper, the way knowledge progresses, and especially our scientific knowledge, is by unjustified anticipations, by guesses, by tentative solution to our problems, by conjectures. These conjectures are controlled by criticism that is, by attempted refutations, which includes severely critical tests [See: Ojong, 2008: 8].

For Popper therefore, scientists do not develop theories on the basis of observations and experiments but on the basis of conjectures and well informed guesses, which are intended to improve upon earlier theoretical accounts about the natural world. In other words, there is according to Popper, even a theoretical background which these observations and experimentations are meant to improve upon. He argues:

the belief that science proceeds from observation to theory is still so widely and so firmly held, that my denial of it is often met with incredulity. I have been suspected of being insincere of denying what nobody in his senses can doubt. But the belief that we can start with pure observations alone without anything in nature of a theory, is absurd [Ojong, 2008: 8].

## **Justifications of Induction**

Whereas some philosophers like Hume, Russell and Popper are of the view that induction is in dire need of both rational and logical justification, others like Ludwig Wittgenstein, Peter Strawson and Stephen Barker are of

the opinion that the problem of induction is a pseudo-problem that arose from confusion of terms and which can be resolved through conceptual clarification. Each of these positions has its strong points. However, philosophers of various persuasions have attempted to resolve the problem of induction by employing various forms of justifications. Let us now examine some of them.

### **The Analytic Justification**

According to the analytic perspective, induction can be justified through an analysis of what is usually meant when for instance, we say that an inference as a correct inductive argument is more probable than any of its equally derailed rivals. On analysis, the explanation goes, we will discover that what we usually mean by saying that the conclusion of an inductive argument is correct or more probable than its rival is that the conclusion has been arrived at in accordance with current or approved inductive procedures, employing the relevant criteria which enable us to assess an inductive argument as correct, probable, rational and justified [Aigbodioh, 1997: 158]. Here, induction is justified by virtue of what the of induction analytically entails.

### **The Predictionist Justification**

This perspective attempts to justify induction on the ground that we have a wealth of experience in the use of inductive inferences, and that in the past, most of the conclusions which we have been led to draw on the basis of inductive reasoning have not only been useful and successful in discovering regularities in the natural world but also in making accurate predictions about future events [Aigbodioh, 1997: 160]. This form of justification underlies the activities of meteorologists and other forecasters, whose reliance on the inductive principle has led to numerous successful and near accurate predictions about the future.

### **The Evolutionist Justification**

The evolutionist justification hinges its argument on the claim that humans, as unique species, are naturally and genetically programmed to comprehend and employ the inductive method in dealing with their world.

The explanation here is to the effect that human beings in the course of natural selection, have acquired the capacity for drawing conclusion on the basis of limited inductive evidence, and have found this practice a useful and reliable way of interpreting their past experiences and making prediction about the future [Aigbodioh, 1997: 162].

### **The Pragmatic Justification**

Instead of seeking to validate the inductive principle itself, the pragmatic approach seeks to validate the practical act of adopting and using induction by disclosing what practical ends or goals would be met if we continue to rely on induction. In other words, while the pragmatists are unwilling (or do we say unable?) to defend induction itself, they are ready to defend its adoption in terms of the ends to be achieved by this adoption, which includes:

...the discovering of further laws which gives greater success in predicting the course of events as well as the unraveling of nature's secrets so that we can understand, predict and control [Aigbodioh, 1997: 163-164].

### **Summary**

In this lecture, we have looked at the meaning and problem of induction. Induction we explained is the method of arriving at some generalisations from observation and experimentation of some particular instances. The problem of induction calls into question, the justification for generalising about the properties of a class of objects based on some number of observations of particular instances of that class, and for presupposing that a sequence of events in the future will occur as they always have in the past. We examined the views of Hume, Russell and Popper on induction and concluded by looking at four attempted justifications of induction, which are: the Analytic justification, the Predictionist justification, the Evolutionist justification and the Pragmatic justification.

## **Post-test**

1. What is induction?
2. What do we mean by the problem of induction?
3. Name the four attempted justifications of induction and explain any two of them.

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## References

1. C. S. Peirce. 1957. *Essays in the Philosophy of Science*. Edited by Vincent Tomas. New York: The Liberal Arts Press.
2. See David Hume. 1975. *Enquiry Concerning Human Understanding*. Edited by L. A. Selby Bigge.
3. Jimmy Wales, "Problem of Induction", *Wikipedia Encyclopedia of Philosophy*. Retrieved from [www.wikipedia.wiki/com](http://www.wikipedia.wiki/com)
4. Jack Aigbodioh. 1997. *Philosophy of Science: Issues and Problems*. Ibadan: Hope Publications.
5. Bertrand Russell. 1985. *The Problems of Philosophy*. Oxford: Oxford University Press.
6. Kyrian Ayiba Ojong. 2008. *A Philosophy of Science for Africa*. Vol. 1. Calabar: African Pentecost Communications.

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## **LECTURE SIX**

### **The Problem of Prediction**

#### **Introduction**

One of the aims of the social sciences is to be able to predict large-scale social events and occurrences. Indeed, prediction is a significant dimension of human experience, but there are questions regarding the extent to which the social sciences can predict future happenings and the accuracy of such predictions. In this lecture, we shall examine the philosophical problem of prediction, most especially as it affects the social sciences.

#### **Objectives**

At the end of this lecture, you will be able to:

1. Understand the problem of prediction;
2. Determine the extent to which the social sciences can be said to predict future social occurrences based on laws governing human-social behaviour.

#### **Pre-test**

1. In the last presidential election in Nigeria, majority of the citizens voted for Dr. Goodluck Jonathan, not because of the Peoples Democratic Party (PDP), but because of his personality. Does this in anyway suggest the in future elections, Nigerians will vote across party lines, for candidates they consider worthy of the office of the president of the Federal Republic of Nigeria?

### **CONTENT**

#### **The Problem of Prediction**

According to the *Cambridge International Dictionary of English*, to predict is to say that an event or action will happen in the future, especially as a result of knowledge or experience. Some scholars have argued that human action - as 'meaningful behaviour' - is normally marked by at least

three characteristics: an awareness of the past, a sense of the rightness and wrongness of action and a vision of the future. The point, here, is that the future is never something that is vacuous or empty; rather it is a mental space that is filled with expectations, hopes and fears, and with strategies and policies designed respectively to maximize or minimize them [See: Ryan, 1970 and Cole, 1973]. It is no wonder therefore that man is seen essentially as a planning creature having a more or less articulated vision of the future and some idea of the means to achieve that vision [Webb, 1995: 139-155].

Such visions and predictions about the future are usually based on theories or beliefs about the world, as well as our experience of the regularity of past performance. Most often however, we predict future social occurrences and act on such predictions, but paradoxically, we do so also in the sure knowledge that often, the future may not be as we foresaw. This raises the philosophical question of whether or not prediction can be said to be the goal of the social sciences.

### **Types of Prediction:**

The distinction has been made between two types of prediction:

1. An intentional prediction
2. An outcome prediction.

An intentional prediction is a statement about the future that indicates the disposition of an actor to behave in a certain way in the future. Factors to be considered in an intentional prediction are: the veracity of the statement, the maintenance of the intention and the capacity to ensure the prediction. An outcome prediction the type that obtains in the natural sciences and is far more independent of personal intentions and biases or the disposition of the actor.

### **The Philosophical Problem of Prediction**

The philosophical problem of prediction follows as a consequence of the problem of induction and the search for certainty. The natural sciences are believed to have discovered laws of nature that were unalterable in time

and space. Hence, the possibility of establishing the likelihood of the future being like the past, as we have the Newtonian assumption that the universe is a determinist order, such that it is in principle possible to predict every state of the universe from a consideration of any other state together with a full knowledge of the causal laws operating at that time.

Though, the social sciences claim to also predict future social occurrences, there are reasons to doubt import and reliability of such predictions. Such reasons include the fact that humans, who are the objects of study in the social sciences, are sentient beings with passions, emotions and freewill. Also, while prediction is often used in natural science as a way of validating an experiment, the nature of prediction in the social sciences frequently precludes its use as a means of validation.

People have to predict, and governments have to predict. Yet, the philosophical basis of such an activity is fraught with problems, some of which have been dealt with by Karl Popper [Popper, 1974]. In the first instance, prediction in the social sciences has been described as having an 'Oedipus effect' of being self-fulfilling at some time, and self-defeating at other times. The argument here is that, unlike natural science, prediction in the social sciences will itself become a factor in the decisions taken by people, who will act to either falsify or fulfill such prediction. For example, if there are some economic indicators that suggest that a recession is on the way and that in all probability, one's job may be at risk with the consequence that you may be unemployed, a prediction has been made. But, this may then lead to say emigration, and a job somewhere else. In such a case, the prediction that one will be unemployed has been falsified, because the prediction itself led to an action that falsified it.

Another argument against prediction in social science also emanating from Karl Popper relates to the discovery of new knowledge. The argument here is that the progress of the human race is dependent upon new discoveries. So, since we cannot anticipate new discoveries, the argument goes, we cannot predict the future of the human society.

Another serious difficulty with prediction in social science is that in many of the cases in the social sciences, the initial conditions relevant to

such prediction are not usually known, whereas to predict, the initial conditions needed to be known.

A problem further associated with prediction in the social sciences concerns the problem of contingency. In history, the past is shaped by contingency or accidental events which cannot be accommodated within any generalized model, with consequence that the future must be seen as being unpredictable.

A further factor that inhibits prediction is that in social science, the same kind of event does not always have the same set of causal antecedents, and similar causal sets may not always have the same effects. For example, the transformation to an industrial society in Britain had very different causal antecedents than the industrial transformation in Taiwan or South Korea. The former occurred in a somewhat ad hoc manner, while in the latter two cases, the industrial transformation was a planned process.

Another factor inhibiting prediction in the social sciences is the very complexity of social explanation itself. The theories used to explain social events are simplifications. No theory is ever able to explain all the facets of the phenomenon to which it refers. In the explanation of past events, we can more easily cope with divergence from theoretical explanations due to the fact that we have knowledge of external interfering factors. With prediction, however, we do not have the advantage of hindsight with respect to the antecedent conditions.

There are two theories that further expatiate on the problem of social prediction. They are the *Catastrophe theory* and the *Chaos theory*. The *Catastrophe theory* deals with the mathematics of sudden change. Many social changes are incremental in the sense that change is steady and reasonably predictable. But some social changes are sudden and often unexpected, catching even knowledgeable observers by surprise. For instance, it is possible to know that a particular situation is ripe for a riot, and yet, not know when, where, or how - or even if - an instigation will occur. Thus, we may reasonably predict without the ability to be precise. Sometimes, we can, on good theoretical grounds, surmise that there will be change but not be able to specify exactly

when that change is going to occur.

The Chaos theory on the other hand argues that in principle, some things are inherently unpredictable. It is not due to the fact that measurements or theories are inadequate - it would not matter how good they are, we would still not be able to predict some things. If we remember that social change or development is a series of movements down a path, a sequence, and that at any moment in that sequence, there is the possibility of bifurcation or division, then we must accept that the direction of the path may change, and this makes prediction difficult, if not impossible [See: Kaplan, 1940: 492-498].

In our analysis of the problem of prediction so far, we have found that the ability to predict events within the natural sciences is predicated on the fact that science has reached a high level of development and that its essential facts stand in a systematic relationship to each other. But this is not the case with the social sciences. This raises the question of whether the social sciences can make singular predictions about initial conditions, such as would enable one to draw from our generalizations, predictions of positive kind.

### **Summary**

In this lecture, we have examined the philosophical problem of prediction, and the problems associated with the social sciences' attempt at predicting the future occurrence of social events. We distinguished between two types of prediction and explained that while an intentional prediction is peculiar in the social sciences, an outcome prediction obtains in the natural sciences, as it is far more independent of the personal intentions and biases or the disposition of the actor. We examined also, two theories that further expatiate on the problem of social prediction. These are the *Catastrophe theory* and the *Chaos theory*.

### **Post-test**

1. What do you understand by the problem of prediction?
2. What is the major difference between an intentional prediction and an

outcome prediction?

3. Outline the main arguments championed by Karl Popper, against prediction in the social sciences.
4. What are the views of the Catastrophe theory and the Chaos theory on the problem of prediction?

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## REFERENCES

1. Alan Ryan. 1970. *The Philosophy of the Social Sciences*. Hong Kong: Macmillan.
2. Cole, H.S.D. et al. 1973. *Thinking About the Future: a Critique of the Limits to Growth*. London: Chatto and Windus.
3. Keith Webb. 1995. *An Introduction to Problems in the Philosophy of Social Sciences: the Problem of Prediction*. London: Pinter.
4. Nicholson" M. 1983. *The scientific analysis of social behavior: a defence of empiricism in social science*. London: Frances Pinter.
5. Onigbinde Akinyemi. 2000. *Philosophy and the social sciences*. Ibadan, Nigeria: Frontline Books.
6. Popper, K.R. (1974). *The Poverty of Historicism*. London: Routledge and Kegan Paul.
7. Oscar Kaplan. 1940. Prediction in the Social Sciences. *Philosophy of Science*. Vol. 7 No.4.

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## **LECTURE SEVEN**

### **Carl G. Hempel's Nomological Model of Scientific Explanation**

#### **Introduction**

The prevailing assumption from time immemorial is that science can solve most, if not all of human problems. In the history of science therefore, attempts have been made towards proffering an adequate, effective and sustainable explanation of its teeming phenomena and objects of study, usually with the aid of explanatory models. In this lecture, we shall be looking at one of such models developed by Carl Gustav Hempel. We shall examine the basic assumptions, merits as well as demerits of this model.

#### **Objectives**

At the end of this lecture, you will be able to:

1. Explain Carl G. Hempel's Deductive Nomological Model of Scientific Explanation

#### **Pre-test**

1. What do you understand by the word model?
2. In what sense can an explanation be said to be a form of model?
1. Consider the following argument:  
All metal expand when heated  
This rod is metallic and is was heated  
Therefore, it expanded.  
To what extent can one say that the conclusion of this argument 'it expanded' is part of the general class of events described by the two reasons or premises?  
How much faith would you still have in the conclusion of the argument if the reasons or premises were discovered to be false?

## **CONTENT**

### **What is a Model?**

A model refers to certain array of conditions that form a template, such that when some things satisfy these conditions and fit the template, it becomes a standard for explaining phenomena or solving problems in the given area. In earlier literatures, a theory can be called a model of another theory, or and can contain an interpretation of it, in so far as the sets of objects which they study are models of the same axiom system, when taken in the way in which they are studied. Hence, "a scientific model is normally a theory intended to explain a given realm of phenomena... or a theory by replacing its terms with more perspicuous ones" [Braithwaite, 1953: 89].

### **Hempel's Model of Scientific Explanation**

Carl G. Hempel is the foremost champion of the formalist thesis - a position we explained earlier as holding the view that scientific theories and explanations must fit into a definite logical structure' in the form of covering law model. In his *Aspects of Scientific Explanation and Other Essays in Philosophy of Science* published in 1965, Hempel explains that all scientific explanations have certain common logical qualities which qualify them to form a model of explanation. Carl G. Hempel designed what he called the Deductive Nomological model of Explanation to show that for any explanation to constitute a scientific law, it must contain certain law-like universal statements which must be related to, and constitute a sufficient explanation of the event to be explained.

The word 'Nomological' or 'Nomology' is derived from the word 'nomos' closely connected with the Greek word *Phusis* which means nature. Technically put, it simply connotes 'regularity in nature'. Therefore a statement is 'nomological' when it resembles a 'law like generalization' (unlike an accidental generalization with a counterfactual force). For example, 'All rocks in my garden are humous' is a statement of 'accidental generalization', for its generality is restrictive to the 'rocks in my garden'



explanation there must be a set of law like statements – L1, L2, Ln which are understood as universal statements of the kind that whenever events of the kind described by C1, C2, Cr take place, event of the kind described by E must of necessity take place. First in the explanation therefore, you have a given fact, that is, what is to be explained. Then you have two set of statements. For these statements to constitute an explanation of the event, the E statement must be deducible from the L and C statements and not from either set alone, and the L and C statement must also be true.

Hempel gives additional requirements which a scientific explanation must meet. First is that it must meet the requirement of what he calls explanatory relevance. By this he means that the statements laying down the laws (law like premises and the initial conditions) should entail the conclusion. In other words, there must be a logical connection between the set of statements or propositions that are used to explain (i.e. the explanans) and the statement that is being explained (the explanandum)

The second requirement a scientific explanation must meet is that of testability. By this requirement, Hempel means that the premises (that is, the explanans) of the model should be such that are empirically testable. In other words, if one makes a metaphysical claim about the world or if one's law-like statements are of the metaphysical kind, they do not according to Hempel, constitute an acceptable scientific explanation. In the same way, when the explanans comprise of analytic claims which have no extra linguistic content, the explanation cannot be said to constitute an acceptable scientific explanation.

These two special requirements are according to Hempel, necessary to have an acceptable scientific explanation. This is not however to say that we cannot have an explanation without the two requirements, but such would definitely not be a scientific explanation.

However, even when the two conditions listed above are meant, a proper scientific explanation still has to show that the L and C statements within the explanans are causally related to the E. statement. All scientific explanations must be shown to be causal explanations. A causal explanation is one which specifies a necessary and sufficient condition for a

certain event to occur. Now, supposing a man is stabbed and he dies. One would ordinarily say that stabbing is the cause of the man's death. The question now is whether stabbing is a necessary and sufficient condition for a man's death! Obviously stabbing is not a necessary condition for a man's death since men die in some other ways without being stabbed. In the same vein, stabling cannot even be said to be a sufficient condition for death since a man may be stabbed and yet may not die. An explanation of the type therefore, that tends to establish a causal link between stabbing a person and the person's eventual death, will turn out not to be a satisfactory scientific explanation. The conclusion to be drawn from the above example is that a necessary and sufficient condition must be conjoined for given statements within the explanans, in order to give an acceptable explanation of event E.

### **The Problem with Hempel's Model**

Many scholars have identified several flaws in the covering-law approach which Hempel adopted in his model. Hempel's explanatory model, it is argued, is fallible because it is possible for the explanans not to explain the explanandum even when the premises of the proposed explanation are true [Bird, 1998: 73].

Again, Hempel's model is based on general laws which serve as covering laws (Explanans) with which the antecedent condition (explanandum) is explained. These general laws themselves are product of inductive generalizations which proceeds from a premise about a sample, to a conclusion about a population. This tends to bring to back the entire problem of induction with all its associated flaws.

Another problem associate with Hempel's model of explanation is that it cannot adequately account for social facts deductively, especially in the social sciences where explanation appeals to reason, motives and desires. In other words, Hempel's Deductive Nomological Model of Explanation only seeks to unpack the causes of events as obtained in the physical sciences, but human actions that are triggered off by reasons, motives or desires are left unaccounted for by Hempel's model.

## Summary

So far in this lecture, we have attempted an assessment of Carl Hempel's Deductive Nomological Model of Scientific Explanation. We started with a brief explanation of the meaning of model and then proceeds to explain Carl Hempel's Deductive Nomological Model. This was followed by an evaluation of Hempel's model by way of critique. The conclusion drawn is that Hempel's model is not an adequate explanatory model for explaining social facts owing to their indeterminacy and unpredictability, as well as the complexities of the human person from whom all social facts emanate.

## Post-test

1. What is a model?
2. Briefly explain Carl G. Hempel's Deductive Nomological Model of Scientific Explanation.
3. To what extent is Hempel's model adequate in the explanation of social facts involving human agents?

## **ENDNOTES**

1. Braithwaite, R.B. 1953. *Scientific Explanation*. New York: Harper Publishers.
2. Ernest Nagel. 1961. *The Structure of Science, Problems in the Logic of Scientific Explanation*. New York: Harcourt, Brace and World Inc.
3. Ofor, F. 1999. The Issues of Method in the Philosophy of the Social Sciences. Dipo Irele (ed.) *Philosophy, Logic and Scientific Reasoning*. Ibadan: New Horn Press.
4. Bird, A. 1998. *Philosophy of Science*. London: UCL Press Ltd.

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## **LECTURE EIGHT**

### **Explanation in the Social Sciences**

#### **Introduction**

Over the years, the breakthrough in science has been so fascinating that many other disciplines have started aligning themselves with the method of science. The prevailing assumption today is that the scientific method is the most effective method of explanation and that every problem is amenable to solution only by the application of the method of science. As Fredrick Copleston aptly puts it, “the scientific method is being progressively substituted for other means of attaining positive knowledge and if there are areas in which the scientific method is inapplicable, they transcend the scope of human knowledge [Copleston, 1980: 12]. This assumption underlies the application of the scientific method in the investigation of human-social phenomena and institutions by the social sciences. In this lecture, we shall examine the extent to which it is appropriate to employ the method which is peculiar to the natural sciences, in the investigation of human-social phenomena and institutions.

#### **Objectives**

At the end of this lecture, you will be able to:

1. Understand the role which the universal principle of causation plays in the formulation of the scientific method;
2. Distinguish between a causal explanation and a reasoned explanation and
3. Justify the inappropriateness of employing the scientific method in the investigation of human-social phenomena and institutions.

#### **Pre-test**

1. What do you understand by the notion of cause and effect?
2. If a man decides to go to the shop to buy bread, can we then say that buying bread is the cause of his going to the shop? What if he gets to

the shop but didn't get bread to buy? Would the cause of his going to the shop be said to be non-existent? Reflect extensively on this puzzle.

## **CONTENT**

### **The Social Sciences and the Scientific Method**

The social sciences, like most other areas of knowledge, employ the method of science in their investigations so as to achieve the following objectives:

- (1) To understand and making more intelligible the behaviour, particularly the social behaviour of human beings.
- (2) To establish the governing laws behind most of human behaviour
- (3) To understand the history of human development, in order to predict in the face of given laws, the future behaviour of man and
- (4) To guide the behaviour of human beings in a socially desirable way.

### **The Principle of Cause and Effect**

However, an essential feature of scientific explanation is that it seeks to provide a causal or correlational connection between an event and its cause. But first, what do we mean by the principle of cause and effect? The principle of cause and effect states that for every event in the universe, there is a set of conditions such that if the conditions are all fulfilled, then the event invariably occurs. Put differently, the principle states that for every event 'B' in the universe, there is always a cause 'A', such that 'B' can always be explained by reference to the activities of event 'A'. This is the principle that underlies the method of explanation in science. By employing the scientific method in social investigation, the social sciences seek to explain the cause of action involving human agents.

A major question that arises here however, is whether or not the universal principle of cause and effect which is very central to the method of explanation in the natural sciences is also applicable to the social sciences.

When for instance, a scientist is asked to explain what produced a particular effect, he will state the cause. But what happens when a man is asked what led to his actions?

## **Reasons versus Causes**

Ordinarily, we use the word 'cause' in the explanation of actions involving human beings. When for instance a man says 'I went home because I was hungry', what he is saying is that the reason he went home was because he was hungry. This to many people means that it was hunger that caused the man's going home. Such an explanation pretends to exchange the words 'reason' and 'cause' for one another without any loss of meaning. To what extent however, can we treat reasons as causes?

In responding to this question, let us first ask what is meant by a reasoned explanation. We know certainly that when a man makes his choice from possible alternatives, he does so on the basis of certain reasons of intentions and motives. It follows that a reasoned explanation is one in which reference is made to some kind of motives or intentions which is purported to give rise to an action. What then should be the status of such an explanation?

Some philosophers have provided arguments contesting the claim that reasons can be treated as causes and therefore that reasoned explanations are causal explanations. According to this group of scholars, explaining any action simply by pointing out the agent's reasons for acting does not entail a full explanatory force and should not be accepted as a full explanation. Carlos specifically argues that the generalisation connecting reasons and actions may not be sharpenable into the kind of law on the basis on which accurate prediction can be made. For him, rationalizations are not causal explanations because there exists a conceptual or logical relation between the reason and the explained action (involving human beings) so that the action is at best explained as a reasonable consequence of that reason [Offor, 2006: 112].

Some others argue that reasons cannot be treated as causes and therefore that reasoned explanations are causal explanations because it is

possible for somebody to act, to have reasons for acting and yet not to have acted because of those reasons, just as it is also possible that the manifest reasons given by an actor for his action may turn out to be different from the latent reasons behind his actions.

Again, when we ascribe some reasons to an action, we are referring to the intention behind the act and intentions are of a status that poses difficulties for our understanding of the notion of cause and effect. Consider the following explanation for instance:

- i. Smith went to the store to buy bread, further explained as
- ii. Smith's reason for going to the store was to buy bread and finally.
- iii. Buying bread caused Smith to go to the store.

In the above explanation, buying bread is said to be the cause of Smith going to the store. What then happens if Smith gets to the store and did not find bread to buy? Could we then say that the cause of his going to the store was non-existent? Also, if the above explanation is correct, that getting bread is the cause of Smith's going to the store, then something is fundamentally wrong with the explanation since Smith has to get to the store first before buying bread, thereby putting the effect before the cause, contrary to our understanding of cause-effect relationship. If reasons are causes, then getting bread must of necessity come before going to the store and not vice versa.

Another general argument as to why the scientific model of explanation is inapplicable in the social sciences centers on the appreciable difference between the objects of study in science and the social sciences. Max Weber is a leading advocate of this argument. According to Weber, the object of study in the social sciences is man and other social and human institutions created by man. These, according to him, cannot be subjected to the same kind of explanatory method used for inanimate objects in the natural science. Most judgements in the social sciences, he argues, neglect freewill, rationality, desires, emotions and other sentient features that come into play in the assessment of man and social phenomena. Human beings (which are the main objects of study in the social sciences) are free moral

agent who not only create their social world, but can alter their actions at will, since there is always room for choice. To Weber, the social sciences should not pretend to apply the method of the natural sciences, but to turn instead to those features that make their objects of study unique like emotions, biases, sentiments etc. Instead of seeking value neutrality, the social sciences should recognize values, study values and make them constitute part of their own procedure. The social sciences, Weber concludes, should empathize with the peoples' values, biases and emotions.

However, a few other scholars insist that reasons can be treated as causes, and that the claim by some that reasons are not causes may have resulted from a confliction between merely inventing or having a reason and acting for that reason. Collingwood for instance argues that reasons are causes and even takes it to the extreme by affirming that the ultimate causal power lies in human reason and that we should not be apt in ascribing causal power to inanimate things and objects in the physical world [Collingwood, 1961: 307].

## **Summary**

So far in this lecture, we have examined the extent to which it is appropriate to employ the method which is peculiar to the natural sciences, in the investigation of human-social phenomena and institutions. We looked at the universal principle of causation which is at the base of explanation in the natural science. We then looked at the difference between a reasoned explanation and a causal explanation and concluded that the unique nature of human being and other objects of social knowledge make them inaccessible to the kind of cause-effect explanatory model used in natural sciences.

## **Post-test**

1. What do you understand by the universal principle of causation?
2. Briefly outline the objectives of the social sciences.

3. What is the difference between a reasoned explanation and a causal explanation?
4. To what extent is it appropriate to employ the scientific in the study of human-social phenomena and institutions?

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## REFERENCES

1. Fredrick C. Copleston. 1980. *Philosophies and Cultures*. Oxford: University Press.
2. Offor, F. 2006. The Fallacy of Causal Principle and the Challenge of Animism. *West African Journal of Philosophical Studies*. Vol. 9.
3. R. G. Collingwood. 1961. On the So-called Idea of Causation. Herbert Morris (ed.) *Freedom and Responsibility*. California: Stanford University Press.

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## **LECTURE NINE**

### **Functional Explanation in the Social Sciences**

#### **Introduction**

Functionalism is a method of explanation which was developed for use in the sciences, and later adopted for use by the social sciences like psychology, sociology and anthropology. Generally speaking, functionalism does not invoke law-like statements as deductive method of explanations, but seeks to explain the function (or the purpose) of a given item, material or issue in natural science, biological system or cultural organisation. In this lecture, we shall look at the origin and meaning of functionalism, the presuppositions of functionalism, the similarities between biological organisms and social units, as well as some criticisms against functionalism as a method of explanation in the social sciences.

#### **Objectives**

At the end of this lecture, you will be able to:

1. Explain the origin and meaning of functionalism;
2. Draw an analogy between biological organisms and social units and
3. Identify some criticisms against the use of functional analysis in the social sciences.

#### **Pre-test**

1. What do you understand by functional explanation?
2. Between the natural sciences and the social sciences, for which do you think functional analysis is most appropriate as a method of explanation?

#### **CONTENT**

##### **What is Functionalism?**

Functionalism is from the Latin word *Fungere* which means 'to perform'. The word functionalism can be used in various senses depending

on the disciplinary perspective from which it is viewed. In Logic, Mathematics, Physics and other natural sciences, the word function is often used. In such areas of study, functional analysis is simply a way of correlating variables. If for instance you say that Y is the function of  $X_1$ ,  $X_2$ ,  $X_3$ , it is to say that the value of Y depends on whatever value we may attach to X. Therefore, if you take Y to be a system, it means that since X is part of Y, then changes which occur in  $X_1$ ,  $X_2$ ,  $X_3$  will necessarily have effect on  $X_n$  and consequently on Y. That is:

Y is a function of ( $X_1, X_2, X_3 \dots X_N$ )

This is the way functional analysis is used in mathematics, physics and other natural sciences.

In Philosophy of Mind, functionalism is a view about the nature of mental states. In Sociology and Anthropology, it is an approach to understanding social processes in terms of their contribution to the operation of social system. In Psychology, it is an approach to phenomena that emphasised mental processes as opposed to static mental structure. Although functional analysis varies in its application from discipline to discipline, our concern in this lecture is first with how functionalism is used in the biological sciences and then with how it is used in the social sciences, since it is from the biological sciences that the social sciences adopted the method. Let us start by looking at some of the presuppositions of functionalism as used in the biological sciences.

The first is that functional analysis is applicable only to systems which are considered as integrated whole. In other words, the system must be integrated such that one part will feel the impact of the other. (For example, the human body is fully integrated but the planetary system is not). Thus, biological organism is conceived as a whole made up of parts, each of which makes some contribution towards its survival.

Another presupposition is that functional analysis is applicable to systems which can be described as goal-directed. In other words, to be able to speak about the function of an object, the activity of that object must have some goal direction.

A third presupposition is that the system for which functional analysis is applicable must be self regulatory. What this means is that if there are deficiencies in one part of the system, compensatory measures are immediately taken to correct or make up for such deficiencies.

Following from the above presuppositions of functionalism in the biological sciences, what most students of society or social scientists did is to create an analogy between biological organism (which is the object of concern in the biological sciences) and the society. Functional analysis in the social sciences is therefore borrowed on the same pattern from the biological sciences in the form of an analogy and this is based on the observed similarities between the organic whole and the social whole. Let us now draw this analogy in a tabula form:

<b>S/NO</b>	<b>BIOLOGICAL ORGANISM</b>	<b>SOCIETY</b>
1	The biological organism is an integrated whole	It is believed that society is also integrated because the different systems – political, economic, social etc have to cooperate in order to function optimally.
2	The biological organism is goal directed. The goal of the biological organism is survival	Society is also goal directed, as it has survival and flourishing as its goal.
3	The biological organism is self regulatory	Society is also self-regulatory. For example, if population overshoots in a society which lacks birth control measures, there are other mechanisms like hunger, death, poverty etc, which regulates birth control. Excess crime is also regulated by religious moral institutions.

Most functionalist writers were influenced by this analogy between societies and biological organisms, and their concept of social function was explicitly modeled on that of biological function. Radcliffe Brown, for instance, in a

work titled *Structure and Function in Primitive Society*, distinguishes between three sets of sociological problems: social morphology, which identifies social structures just as biological morphology identifies organic structures; social physiology, which identifies the functions of these structures; and development, which studies how new social structures arise, much as evolutionary theory explains the development of new kinds of organisms. Malinowski, who introduced the term functionalism into anthropology, identified seven fundamental biological needs: metabolism, reproduction, bodily comforts, safety, movement, growth, and health...and held that, the function of social processes was ultimately to satisfy these individual needs.

### **Functionalism in the Social Sciences**

Functional analysis in the social sciences originated in the early nineteenth century in the works of thinkers such as Herbert Spencer (1820-1903) and Emile Durkheim (1858-1917). It was further developed in the early and middle twentieth century as an approach to Anthropology and Sociology by A. R Radcliffe-Brown (1881-1955), B. Malinowski (1884-1942) and Talcott Parsons (1902-1979), Robert Merton (1910-2003). Functionalism relies upon 'organic' analogy of human society as being 'like an organism'; a system of interdependent parts that function for the benefit of the whole. Thus, just as human body consists of parts that function as an interdependent system for the survival of the whole, so also the society has different independent parts that functions for the survival of the whole society. Relying upon the successes of biologists in understanding human body, functionalists took a similar approach to understanding human social systems. Social systems were dissected into their parts or institutions (family, education, economy, polity and religion), and these parts were examined to find out how they worked and their importance for the larger social system. The rationale was that if social scientists could understand how institutions worked, then their performance could be optimised to create an efficient and productive society. The social systems to which functional analysis was applied ranged from units as small as the family to those as large as international organizations. Functional analysis in the

social sciences has been criticized on certain grounds by both philosophers and social scientists alike.

### **A Critique of Functionalism in the Social Sciences**

The first set of criticisms against functional analysis in the social sciences centers on the analogy between biological organisms and social units. In the first place, it is argued that the similarities between biological organisms and social units are not as simplistic as they are made to appear. In the organism, the parts make contribution for the survival of the whole or else the organism dies. But can we talk of the society dying in the way the organism dies, if a part fails in its contribution? Human societies do not die in the physical sense of the word. Individuals come in and go out but the society goes on living. Even a complete social change does not indicate the death of the society as some elements of the old society such as language, custom, belief etc are retained in the new society.

The second point of disanalogy between biological organisms and social units is that while the former is fully an integrated unit, the later is not. In the biological unit, the integration is so much that it will be inconceivable to think of the parts living outside the unit. But, we can have social deviants who might not be fully integrated into the society.

Again, the nature of the relationship between one part of the biological organism and another is different from the relationship between parts of a social unit like human beings. The difference is based on the fact that human beings are sentient beings who think and act in accordance with their freewill. Their actions are not therefore determined, but the activities of cells of a biological organism are determined.

Another point is that the goal of a biological organism is always bare survival, whereas the goal of social unit is much more than bare survival. Most societies, in addition to surviving, want to flourish. Men are not contented with bare survival, they also want to flourish, that is, have some luxury, fame and so on. That is the reason people commit suicide when they find out that all that is left is bare survival.

Finally, it is argued that while the roles of parts in the biological organism are not interchangeable, those of the parts of the social unit are interchangeable. For example, there is no way the eye can do the function of the leg or for the heart to change its function of pumping blood to that of sight. But a professor can change and become a banker or a politician.

Besides the above criticisms that revolve round the analogy between biological organisms and social units, there are other more general criticisms. One of them is the epistemological argument which sees functionalism as tautologous, because it attempts to account for the development of social institutions solely through recourse to the effects that are attributed to them and thereby explains the two circularly. But as Durkheim rightly notes, "when ... the explanation of a social phenomenon is undertaken, we must seek separately the efficient cause which produces it and the function it fulfills". But functionalism, some have argued, explains the original cause of a phenomenon with reference to its effect, and is therefore, not teleological but tautologous.

Further criticisms have been leveled at functionalism by proponents of other social theories, particularly conflict theories, Marxists, feminists and postmodernists. Conflict theories criticised functionalism's concept of systems as giving far too much weight to integration and consensus, and neglecting independence and conflict. It did not account for those parts of the system that might have tendencies to mal-integration. It is these tendencies according to Lockwood, that come to the surface as opposition and conflict among actors. Some feminist scholars accused functionalism of neglecting the suppression of women within the family structure and of over-emphasising the positive functions of the family for society over its dysfunctions for women.

## **Summary**

<p>So far in this lecture, we have looked at the origin and meaning of functionalism, the presuppositions of functionalism, the similarities between biological organisms and social units, as well as some criticisms</p>
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against functionalism as a method of explanation in the social sciences. Functionalism, we said, can be used in various senses depending on the disciplinary perspective from which it is viewed. The presuppositions of functionalism are that the method is applicable only to systems which are considered as integrated whole, goal-directed and self-regulatory. One major criticism against functional analysis in the social sciences is that the analogy between biological organisms and social units are not as simplistic as they are made to appear.

### **Post-test**

1. What is functionalism?
2. Name four exponents of functionalism in the social sciences.
3. List at least three similarities between biological organisms and social units.
4. Discuss five criticisms against functional analysis in the social sciences.

## REFERENCES

1. Barnard, A. (2000). *History and Theory in Anthropology*. Cambridge: CPU.
2. Radcliffe Brown. 2004. *Structure and Function in Primitive Society*. New York: Freeman Press.
3. Kuper A. 2000. *Functionalism: A Protest*, London: Routledge.
4. Elster, J. 1990. *Merton: Functionalism and the Intended Consequences of Action*. London: Falmer Press.
5. Parsons, T. 1961. *Theories of Society: Foundations of Modern Sociological Theory*. New York: Free Press. '
6. Merton, Robert. 1957. *Social Theory and Social Structure*. London: The Free Press.
7. Coser, L. 1977. *Masters of Sociological Thought: Ideas in Historical and Social Context*. Fort Worth: Harcourt Brace Jovanovich, Inc.
8. Davis, Kingsley and Wilbert E. Moore. 1970. Some Principles of Stratification. *American Sociological Review*. Vol. 10 No. 2.

## **CHAPTER TEN**

### **Holism Versus Methodological Individualism**

#### **Introduction**

The doctrine of Methodological Individualism was introduced as a methodological precept for the social sciences by Max Weber. It amounts to the claim that social phenomena must be explained by showing how they result from individual actions, which in turn must be explained through reference to the intentional states that motivate the individual actors. Methodological Holism on the other hand is the view that holds that meaningful social science knowledge is best or more appropriately derived through the study of groups, organizations forces and processes. Over the years however, instead of the two doctrines contributing progressively towards a more complete social knowledge, there has been tension between them. In this lecture, we shall examine the doctrines of Methodological Individualism and Methodological Holism. We shall examine the main claims of both positions and conclude with a critique of the main arguments of Methodological Individualism against Holism.

#### **Objectives**

At the end of this lecture, you will be able to:

1. State the main claims of Methodological Individualism and Methodological Holism;
2. Name the merits and demerits of each position and
3. Decide on your own, which approach you consider most appropriate for explanation in the social sciences.

#### **Pre-test**

1. As an individual, what do you understand by Individualism and as a member of a community, a society and a state, what do you understand by Holism?

2. In your own opinion, how do you think social problems can be better understood and resolved? Is it by looking at them from the level of individuals or as a collective?

## **CONTENT**

### **Methodological Individualism**

The phrase 'methodological individualism' was first coined and used by Max Weber's student, Joseph Schumpeter 1908 [Schumpeter, 1909 and Goldstein, 1958]. However, the theoretical elaboration of the doctrine is due to Weber. Schumpeter merely uses the term as a way of referring to the Weberian view. Weber articulates the central precept of methodological individualism in the following way:

When discussing social phenomena, we often talk about various "social collectives", such as states, associations, business corporations, foundations, as if they were individual persons. Thus, we talk about them having plans, performing actions, suffering losses, and so forth. The doctrine of methodological individualism does not take issue with these ordinary ways of speaking, it merely stipulates that in sociological work, these collectives must be treated as solely the resultants and modes of organization of the particular acts of individual persons, since these alone can be treated as agents in a course of subjectively understandable action [Ratner, 2007].

Methodological Individualism therefore, is the view which holds that meaningful social science knowledge is best or more appropriately derived through the study of individuals [Lars, 2001]. It holds further that facts about society and social phenomena are to be explained in terms of facts about individuals.

In his book titled *Individualism and Economic Order*, A. Von Hayek writes: "there is no other way towards an understanding of social phenomena but through our understanding of individual action directed towards other people and guided by their expected behavior". In this same

vein, Karl Popper once remarked that “all social phenomena and especially the functioning of all social institutions should always be understood as resulting from the decisions, actions (and) attitudes of human individuals” and that “we should never be satisfied by an explanation in terms of the so-called collectives”. If the above remarks by Hayek and Popper are correct, it follows that the ultimate constituents of the social world are individuals, who act more or less appropriately in the light of their dispositions and understandings of their situations.

Methodological individualism as a method of approach is not intended to mean that in the social world, only individuals are true. Social phenomena are not just mere constructs of the mind, they indeed exist in reality! Methodological individualism as a prescription for explanation, is asserting that no purported explanations of social phenomena are to count as explanations unless they are wholly couched in terms of facts about the individuals.

### **Methodological Holism**

Methodological Holism is the view which claims that the whole is over and above the parts that constitute it; that there are certain properties which can be attributed to a whole but which cannot be attributed to the parts that make up the whole. Holism entails the non reductionist position that social concepts cannot be reduced to a psychological one without a remainder. Of course, there are social facts which define the character of the society as an integrated entity. For instance, we can talk about the Nigerian Civil Service. This characteristic needs not be shared by the individuals that make up the social group, it is peculiar to the group as a whole. Methodological Holism is the view that holds that meaningful social science knowledge is best or more appropriately derived through the study of groups, organisations, forces and processes.

The fundamental question that underlies the debate between Individualism and Holism is whether we should treat large scale social events and conditions as mere aggregate or configuration of the actions, attitudes, relations and circumstances of the individual men and women,

who participated in, enjoyed or suffered them. Methodological individualism says we should. Holism on the other hand insists that social phenomena should be studied at their own autonomous, macroscopic level of analysis.

## **Methodological Individualism Versus Holism**

Several arguments have been advanced against Holism by the advocates of Methodological Individualism, but we shall consider a few of them in this lecture. The first major argument is ontological and it is to the effect that there can be no social facts unless there are individual facts. In other words, the existence of social facts presupposes the existence of the individual facts. How for instance can we say that there is a university but no students? Social facts are created by individuals through their actions, attitudes and beliefs. It seems paradoxical to suggest therefore that social objects, so constituted, could be explained other than individualistically.

The second main argument is epistemological and it is to the effect that social facts are not capable of being inspected. We cannot perceive them in the same way we perceive individuals. In other words, whereas we can observe human individuals, we cannot similarly obtain knowledge of the macro features of a social group. According to Watkins, "The social scientists and historians have no direct access to the overall structure and behavior of a system. An understanding of an abstract social structure should be derived from empirical beliefs about concrete individuals" [Watkins, 1952].

Another argument from the linguistic angle is to the effect that all of the concepts used in social science theory can be exhaustively analysed in terms of interests, activities and volitions of individual human beings. As Watkins puts it, "all predicates which range only over individual phenomena... and statements about social phenomena are translatable without loss of meaning into statements that are wholly about individuals".

Finally, if Holism is true another argument goes, then individual human beings will be mere pawns in the society. Again, if Holism is true, then we will be treating society as a goal-directed object, or as a being able

to direct its own goal, without due regards to individual human beings who in actual fact, are the real movers of society.

We cannot conclude this critique by pretending that Holism has no strong points. Macro explanations may sometimes be both true and informative. How for instance, can one explain the outbreak of a revolution without referring to economic and social trends in the society as a whole? Even Methodological Individualism concedes to this point. All they seem to be saying, according to Watkins, is that “until we manage to reduce such explanations to terms of the psychology of individuals, we fail to achieve a full understanding of what has occurred”.

### **Summary**

So far in this lecture, we have looked at the meaning of Methodological Individualism and Methodological Holism. Methodological Individualism is the view that social phenomena must be explained by showing how they result from individual actions, which in turn must be explained through reference to the intentional states that motivate the individual actors. Methodological Holism on the other hand, holds that meaningful social science knowledge is best or more appropriately derived through the study of groups, organizations, forces and processes. We examined the main claims of both positions and concluded with a critique of the main arguments of Methodological Individualism against Holism.

### **Post-test**

1. What is Methodological Individualism?
2. What is Methodological Holism.
3. Discuss at least four main arguments of Methodological Individualism against Holism.

## REFERENCES

1. See: Joseph Schumpeter. 1909. On the Concept of Social Value. *Quarterly Journal of Economics*. See also Goldstein, Leon. 1958. The Two Theses of Methodological Individualism. *The British Journal for the Philosophy of Science*.
2. Ratner, C. 2007. Contextualism versus Positivism in Cross-Cultural Psychology. In G. Zheng, K. Leung, & J. Adair (eds.) *Perspectives and Progress in Contemporary Cross-cultural Psychology*. Beijing: China Light Industry Press.
3. Udehn Lars. 2001. *Methodological Individualism*. London: Routledge.
4. Watkins, J.W.N. 1952. The Principle of Methodological Individualism. *The British Journal for the Philosophy of Science*.

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## **General Conclusion**

So far in this course, we have interrogated the critical issues arising from Philosophy's involvement with the Social Sciences. We started by justifying philosophy's involvement with other discipline, most especially with the natural and social sciences. We looked at the enterprise of science, most especially the method of conducting researches in the natural sciences and then reflected on some problems confronting the scientific method of investigation, prominent among which are the Problem of Induction and the Problem of Prediction. We examined Carl G. Hempel's Deductive Nomological Model of Explanation and then considered the extent to which the method of explanation commonly used in the natural sciences is appropriate for use in the social sciences. On rejecting the use of the scientific method in the investigation of human-social phenomena, we then examined Functionalism, Holism and Individualism as prescriptions for explanation in the Social Sciences. Having considered all these, one can then conclude that in a sense, we have fulfilled a major function of philosophy, which is, to examine the basic concepts, principles and theoretical foundations of other disciplines, but this time around, of the social sciences.

## **Bibliography**

- Ackoff, R. L, Gupta, S. K. and Minas, J. S. 1962. *Scientific Method, Optimizing Applied Research Decisions*, New York: John Wiley and Sons.
- Aigbodioh. J. A. 1997. *Philosophy of Science: Issues and Problems*. Ibadan: Hope Publications.
- Bird, A. 1998. *Philosophy of Science*. London: UCL Press Ltd.
- Braithwaite, R. B. 1953. *Scientific Explanation*. New York: Harper Publishers.
- Broody, B. 1970. *Readings in the Philosophy of Science*, New Jersey. Prentice Hall Inc.
- Chalmers, A. 1976. *What is This Thing called Science?* 2<sup>nd</sup> edition. Queensland University Press.
- Collingwood, R. G. 1961. On the So-called Idea of Causation. Herbert Morris (ed.) *Freedom and Responsibility*. California: Stanford University Press.
- Copleston, F. C. 1980. *Philosophies and Cultures*. Oxford: University Press.
- Derry, G. N. 1999. *What Science Is and How It Works*. New Jersey: Princeton University Press.
- Elster, J. 1990. *Merton: Functionalism and the Intended Consequences of Action*. London: Falmer Press.
- Hanson, R. 1960. *Pattern of Discovery*. London: Cambridge University Press.
- Hempel, C. G. 1970. *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science*. New York: The Free Press.
- Hospers, J. 1946. What is Explanation? *Journal of Philosophy*, Volume II.
- Ikporukpo, C. O. 2001. The Object and Nature of Social Sciences. Chris O. Ikporukpo (ed.) *Government, Society and Economy*. Ibadan: Sterlin Horden Publishers.
- Kaplan, O. 1940. Prediction in the Social Sciences. *Philosophy of Science*. Vol. 7. No.4.
- Kuper, A. 2000. *Functionalism: A Protest*. London: Routledge.

- Lars, U. 2001. *Methodological Individualism*. London: Routledge.
- Leon, G. 1958. The Two Theses of Methodological Individualism. *The British Journal for the Philosophy of Science*.
- Maxwell, N. 1974. The Rationality of Scientific Discovery, Part 1: The Traditional Rationality Problem. *Philosophy of Science*. Vol. 41. No. 2.
- Morgan, R. P. et. al. 1979. *Science and Technology for Development: The Role of US Universities*. New York: Pergamon Press.
- Nagel, E. 1961. *The Structure of Science, Problems in the Logic of Scientific Explanation*. New York: Harcourt, Brace and World Inc.
- Nicholson, M. 1983. *The Scientific Analysis of Social Behavior: A Defence of Empiricism in Social Science*. London: Frances Pinter.
- Offor, F. 1999. The Issue of Method in the Philosophy of the Social Sciences. Dipo Irele (ed.) *Philosophy, Logic and Scientific Reasoning*. Ibadan: Hew Horn.
- Offor, F. 2006. The Fallacy of Causal Principle and the Challenge of Animism. *West African Journal of Philosophical Studies*. Vol. 9.
- Ojong, K. A. 2008. *A Philosophy of Science for Africa*. Vol. 1. Calabar: African Pentecost Communications.
- Olu-Owolabi, K. A. 2011. *My People Perish for Lack of Philosophy*, Inaugural Lecture, Ibadan: University of Ibadan Press.
- Olutayo, A.O. 2001. The Subject Matter and Scope of Sociology. Chris O. Ikporukpo (ed.) *Government, Society and Economy*. Ibadan: Sterlin Horden Publishers.
- Onigbinde, A. 2000. *Philosophy and the Social Sciences*. Ibadan, Nigeria: Frontline Books.
- Palmer S. 1957. *Social Theory and Social System*. Indianapolis: Free Press Ltd.
- Parsons, T. 1961. *Theories of Society: Foundations of Modern Sociological Theory*. New York: Free Press.
- Popper, K. 1959. *The Logic of Scientific Discovery*. Routledge Classics.
- Popper, K. 1963. *Conjectures and Refutations: The Growth of Scientific Knowledge*. New York: Harper and Row.

- Popper, K. R. (1974). *The Poverty of Historicism*. London: Routledge and Kegan Paul.
- Rapheal, D. D. 1976. *Problems of Philosophy*, London: Macmillan.
- Ruder, R. S. 1966. *Philosophy of Social Science*. New Jersey: Prentice Hall.
- Russell, B. 1985. *The Problems of Philosophy*. Oxford: Oxford University Press.
- Ryan, A. 1970. *The Philosophy of the Social Sciences*. Hong Kong: Macmillan.
- Ryan A. 1981. "Is the Study of Society a Science" in Potter D. et. al, *Society and the Social Sciences*, London: Routledge and Kegan Paul.
- Watkins, J.W.N. 1952. The Principle of Methodological Individualism. *The British Journal for the Philosophy of Science*.
- Webb, K. 1995. *An Introduction to Problems in the Philosophy of Social Sciences*. London: Printer.
- Schumpeter, J. 1909. On the Concept of Social Value. *Quarterly Journal of Economics*.