THE ONTOLOGICAL FOUNDATION OF POSITIVIST EPISTEMOLOGY

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Abstract
The central argument of this paper is that what is referred to as positivist or empiricist epistemology is a superstructure resting on the substructure of a certain metaphysical orientation – materialism. The paper traces this point from several premises informing the activities of scientific inquiries as well as figures in the discourse. Epistemology, it is understood, is the search for those general, foundational normative principles and procedures for arriving at reliable and indubitable knowledge. At the heart of the traditional project of epistemology, however, is the problem of justification, which neither the foundationalist nor coherentist can resolve conclusively in an exhaustive sense. And so, the scientific image of knowledge presented by the positivists is that, if we are to arrive at any reliable knowledge of objective reality, then, we must conduct our enquiries in the light of the general laws of science and the scientific method. However, the materialist's orientation that underlies the scientific image of knowledge presents an intractable difficulty. One of such is that it is hard to establish the a priori, necessary, normative intervention of the human mind guided by free will. In other words, the human search for knowledge is deterministic, and so cannot be normative. This raises the question of the normative status of positivist epistemology. The paper employs a philosophical method of analysis, conceptual clarifications and reconstructivism to arrive at the thesis defended therein.

Keywords: Constructivism, Epistemology, Knowledge, Ontological foundation, Positivism.

Introduction

Positivism is a general defence of empiricism. The term was used first by the social reformer, Henri, Comte de Saint-Simon, to designate scientific method and its extension to philosophy. August Comte adopted the concept in his discourse which gained powerful acceptance in the earlier part of the twentieth century. The characteristic theses of positivism are that science is the only valid form of

rationality, and so, the task of philosophy is to find the general principles common to all the sciences and to use these principles as a guide to human conduct and as the basis of social organization and research.[1]

Positivism denies abstract entities in favour of concrete particulars. It claims that the universe and, by extension, human beings are ordered and regulated by natural laws. And so, the task of science is to establish those laws and incorporate them under a more general law. It is a view that our knowledge of the world and matters of fact must be derived from possible experience, and the truth of this must be justified only from experience and not a priori. It also approves a method of reasoning through which we claim to know new things and make generalizations through induction. Positivism depends solely on facts. Essentially, experience, observation and experimentation are central to positivism. All truths, it argues, must be subjected to observation and experiment, and so denies the existence or intelligibility of forces or substances that go beyond facts and the laws ascertained by science. This is aimed at avoiding incompatibility. It also proposes that theories that must respond to all human affairs should not be fictitious. It is an aversion to the hard deductiveness of metaphysicians that seeks to discover what is behind all appearances. Positivism, therefore, is an attempt to unite the world into a single system, thereby giving authority to science as the paradigm of knowledge and rationality. And so, contemporary forms of positivism, distinct from logical positivism and Comte's positivism, is evident in the twentieth-century discourse of the positivist epistemologist.[2] Thus, this paper poses to show that positivism derives its progress from the search for knowing what is there, and this would be represented below.

The Background of Positivist Epistemology

Epistemology analyses the nature, scope and limit of human knowledge and related notions, such as certainty, belief, truth and justification. It aims to distinguish opinions from knowledge. Epistemology, therefore, is the theory of knowledge. It deals with human cognitiveness. Closely related to epistemology is metaphysics which tells us how we can know what there is.[3] To that extent, positivist epistemology has a historical underpinning in the history of philosophy. It lies in the emergence of, or from, the basis of modern empiricism. Empiricism and science have enjoyed a robust marriage throughout Western Europe,

[1] Nicola Abaggnano, "Positivism", In Encyclopedia of Philosophy Vol. 1, 2nd Edition, Donald M. Borchert, Ed., (New York: Thomson and Gale), 710-711.
[2] Ted Honderich, *Oxford Companion to Philosophy, New Edition*, (Oxford: Oxford UP, 2005), 743.
[3] Cynthia Macdonald, Varieties of Things: Foundations of Contemporary Metaphysics, (Malden: Blackwell Publishing, 2005), 3.

proceeding from seventeenth to the eighteenth century. Empiricism, over time, has yielded to a particular line in its practice and method, and so, thinkers or agents along this line have instituted and readjusted as well as transformed its practices and norms, which have, however, privileged science as an ideal of rationality and objectivity.

Behind the progress in science, believed to be thoroughly informed by reason,[4] and the development of sophisticated tools in extending our perception of the world, this progress takes flight from basic philosophical grounds here presented. It is of a truth that the Greek Atomist speculated about the nature of matter, but such speculation has been replaced by detailed experimental knowledge.[5] The possibility of that was as a result of the release of science from the metaphysical authority of the church. This, however, paved way for a return to Aristotelian philosophy in the understanding of the world and ultimately in Isaac Newton's *Principia* (1687).[6] And so, since the time of Newton to the twentieth century, our claims to knowledge, properly speaking, must be inferred from or confirmed by experience. This became the task of the positivist.

From the foregoing, the source of inspiration for positivist epistemology is David Hume (1711-1776). The achievement of Newton in the study of the natural world was continued by Hume as the science of man – in his acting, feeling and thinking aspects.[7] Hume emphasizes on the use of the experimental method to develop his science, and he says:

> We can only expect success, by following the experimental method and deducing general maxims from a comparison of particular instances. The other scientific method, where a general abstract principle is first established and is afterwards branched out into a variety of inferences and conclusions, may be more perfect in itself, but suits less the imperfection of human nature, and is a common source of illusion and mistake in this as well as in other subjects.[8]

The use of the experimental method as a source of knowledge was an attempt by Hume to show opposition to the continental philosopher's rationalism. To be precise, his science of man originated from his theory of perception. Perception

[4] Philip Kitcher, *The Advancement of Science*, (Oxford: Oxford University Press, 1993), 4.
[5] Alexander Bird and James Ladyman, *Arguing about Science*, (New York: Routledge, 2013), 1.
[6] Robin Gordon Brown & James Ladyman, *Materialism: A Historical and Philosophical Inquiry*, (New York: Routledge, 2019), 49.
[7] Newton-Smith H. William, "Hume", Newton-Smith, H. William (Ed.), *Blackwell Companion to Philosophy*, (Oxford: Blackwell Publishers, 2001), 165.
[8] Anne Jaap Jacobson, "David Hume on Human Understanding", In *British Philosophy and the Age of Enlightenment Vol. 5*, Edited by Stuart Brown, (New York: Routledge, 1996), 123.

includes sensations, passions and emotions which are clear, vivid and forceful.[9] For Hume, like Pyrrho, all knowledge is derived from the senses. Perceptual knowledge, he says, are from impression and idea. Sense experiences or perceptual contents, which include; touching, seeing, hearing, tasting, are such that their immediate objects of focus are impression. Ideas, therefore, are the thoughts about those mental contents. Overlapping the two is one of degree, in which ideas are faded impression or lively perception which we are conscious of when we reflect on those forceful or hard impressions.[10] Though the human mind is understood to be passive at the time of impression, it is, however, active during reflection on perceptual contents. He further argues that the human mind can compound, augment and transpose experience.[11] Crucial to this understanding is the strict dichotomy between relations of ideas and matters of fact, where the former is concerned with analytic propositions whose truths are not discovered in experience and the latter whose truths are contingent and discovered in experience. His adherence to empiricism has contributed largely in the discourse of philosophy of science, in which lies the refutation of the constancy of nature, thereby leading to scepticism. His conclusion, therefore, as regards the science of man, is man's habit and custom to think inductively, a problem he did not solve on the basis that there would be no justification for induction. This conclusion sounds an escape from rationalism. And so, it is impossible to know the world and it is certain.[12] The gap for justification of our knowledge of the external world and the regularity of nature requires justification, and this inquiry lies in the hand of epistemology. Despite some grey areas in Hume's philosophy, some of his claims paved way for positivism or positivist philosophy. One of such is that words are meaningless unless they can be defined in terms of words standing for types of simple experiences.[13] This implication took its root from Hume's work. He writes:

> If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, does it contain any abstract reasoning concerning quantity or number? No. does it contain any experimental reasoning concerning matter of fact and existence? No. commit then to the flames; for it can contain nothing but sophistry and illusion.[14]

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[9] Jacobson, "David Hume on Human Understanding," 124.
[10] Stephen Priest, *The British Empiricists,* (New York: Routledge, 2007), 146.
[11] Jacobson, "David Hume on Human Understanding," 125.
[12] Avrum Stroll, *Twentieth Century Analytic Philosophy,* (New York: Columbia University Press, 2000), 67.
[13] Newton-Smith, H. William, "Hume", Newton-Smith, W.H. (Ed.), *Blackwell Companion to Philosophy,* 166.
[14] Stroll, *Twentieth Century Analytic Philosophy,* 54.

From the foregoing, Hume's philosophy generated an attitude of suspicion towards words that are not derived from impression. Along this line of thought, Bertrand Russell says, "every proposition which we can understand must be composed wholly of constituents with which we are acquainted".[15] Indeed, Wittgenstein propositionally states thus, that the right method of philosophy would be this: to say nothing except what can be said.[16] To that extent, metaphysical statements that are deductively in want of signs were discarded. This position combined with the tautology of analytic truth and the fact that knowledge is derived from experience informed the twentieth-century logical empiricism.

Logical Empiricism

The emergence of twentieth-century philosophy witnessed a certain breakthrough in science. It birthed Albert Einstein's special theory of relativity and quantum mechanics, notably also is logical positivism. Avrum Stroll regards this tradition as a radical form of scientism.[17] Its successes were a combination of Hume's philosophy and the reading of Ludwig Wittgenstein's *Tractatus Logico-Philosophicus* (1929). Essentially, logical empiricism is a vital movement in philosophy in the second half of the twentieth century; the result of this philosophy was to put an end to the post-Kantian philosophy. This project was embarked upon with an emphasis on modern logic (a symbolic language) and empiricism. Positivist epistemology or logical empiricism emerged alongside logical positivism. The latter flourished in the 1920s and 1930s in Vienna, while the former flourished in Berlin in the 1940s and 1950s. Both groups suffered the Nazi reign but separated as they gained acceptance in the German-speaking world.[18] Members of these groups also share the similar view that succession of theories is central in the physical sciences, and this constitutes a progression again. They agree that the achievements of earlier theories were retained in later theories. Accordingly, they hold that there is no systematic way to generate new hypotheses; once hypotheses have been proposed, there are principles for their proper assessment in the light of statements of evidence.[19] Again, logical empiricism differed from logical positivism, in that the scope of science is not limited to reduction but prediction, description and explanation. The marriage between logical positivism and logical empiricism experienced a divorce as a result of

[15] Stroll, *Twentieth Century Analytic Philosophy*, 52.
[16] Stroll, *Twentieth Century Analytic Philosophy*, 62.
[17] Stroll, *Twentieth Century Analytic Philosophy*, 54.
[18] Wesley C. Salmon, "Logical Empiricism", Newton-Smith, W.H. (Ed.), *Blackwell Companion to Philosophy*, (Oxford: Blackwell Publishers, 2001), 233.
[19] Kitcher, *The Advancement of Science*, 5.

concepts that were not separated. This was exposed by Hans Reichenbach, and he says:

> But it seems to me to be at least doubtful whether this reduction to perceptual reports and pure logic exhaust everything we mean to include in our assertions about reality. These doubts are principally aroused when we consider the use of the concept of probability in the natural science, for if we accept Carnap's reduction of scientific assertions, we forfeit the indisputable basic principle that such assertions are not merely reports of past perceptual experiences, but are also invariably predictions of future perceptual experiences. it is a puzzle to me just how logical neo-positivism [as opposed to the earlier positivism of Ernst Mach] proposes to include assertions of probability in its system, and I am under the impression that this is not possible without an essential violation of its basic principles.[20]

Reichenbach, in his philosophy, argues that the conclusion of the logical positivists does not support the actual practice of science. He maintains that an analysis of meaning arrived at by the logical positivist, concerning the proposition of science, is nothing but a repetition of 'report propositions,' since it is based on statements about the immediate present. Meanwhile, scientific propositions make assertions about the future. Consequently, there is no scientific law which does not involve a prediction about the occurrence of future events.[21] And so, as a result of the refutation of the reduction of scientific assertions from perceptual experiences, positivist epistemologists endeavoured to analyse 'good science', a task to uncover the logic of confirmation, the logical structure of theories and the logic of explanation. With this, they formulated those canons and criteria that they took to be tacitly employed by scientists in their everyday work.[22] They settled for 'projection,' a concept employed by Reichenbach which, in a sense, has to do with probabilistic relations that involve inductive inferences, rather than definitional relations.[23] These, in their view, enable us to extend our knowledge from one domain to another.

Furthermore, Reichenbach, in "Logistic Empiricism in Germany and the Present State of its Problem" (1936), argues that in every theory of propositions about the future, one point seems to him to be quite clear. When we state a proposition about the future, we never pretend that it is certainly true... but, in

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[20] Salmon, *"Logical Empiricism,"* 234.
[21] Hans, Reichenbach, "Logistic Empiricism in Germany and the Present State of its Problem", *The Journal of Philosophy*, Vol. 33 No. 6, (1936), 152.
[22] Kitcher, *The Advancement of Science*, 5.
[23] Salmon, "Logical Empiricism," 237.

principle 'decidable'... And so, because of different possibilities concerning the eventuation of the future fact, we must, therefore, construct a scale of gradation of propositions which ascribe, on the basis of past facts, a certain degree of truth to every possible proposition concerning the future event.[24] These expressions stand to justify probabilistic projections and predictions from evidential proofs.

The Scientific Understanding of Knowledge

So far, an attempt has been made to represent what is generally referred to as positivist epistemology, that is, the positivist understanding of human knowledge. As we know it, the task of epistemology, in its traditional sense, has to do with an inquiry into the nature, character, content and limit of human knowledge. The project of traditional epistemology has been made so difficult by the problem of justification, wherein it is nearly impossible to establish our structure of knowledge on any incorrigible and indubitable foundation. The foundationalists can speak for themselves on this matter. And so, logical positivism or logical empiricism presents what is usually referred to as a more viable alternative that, if we must discover reliable knowledge, if we must enquire into the nature of human knowledge, then we must go the way of empirical sciences. What is generally referred to as scientific knowledge consists of claims about the world or statements about facts or observation of facts, hypotheses, theories and laws. Scientific knowledge also includes the method(s) of arriving at such knowledge: in sum, it has to do with the body of assumptions, axioms, principles and procedures of science. We now attempt some statements about these constituents of scientific knowledge.

Scientific Facts

Traditionally, a fact is the worldly correlate of a true proposition; a state of affairs whose obtaining makes a proposition true. Thus, facts are actual states of affairs possessing internal structure of competence of object and properties or relations.[25] What is so special about science is that it derives from facts, rather than being based on personal opinion. Indeed, as J. J. Davies writes, "Science is a structure built upon facts".[26] Knowledge, based on the enterprise of science, is derived from what we can see, hear and touch, rather than on personal opinion or speculative imaginings. The assumption in this regard is that if observation of the world is carried out in a careful, unprejudiced way, using the senses, then the facts established in this way constitute secure, objective knowledge. Three components

[24] Reichenbach, "Logistic Empiricism in Germany and the Present State of its Problem," 153-4.
[25] Honderich, *Oxford Companion to Philosophy, New Edition,* 267.
[26] John James Davies, *On Scientific Method: How Scientists Work,* (London: Longman Green and Co., 1968), 8.

of the nature of scientific facts assumed to be the basis for the formulation of scientific knowledge can be distinguished. They are that (i) facts are directly given to careful, unprejudiced observation, through the senses; (ii) facts are prior to, and independent of, scientific knowledge; and (iii) facts constitute a firm and reliable foundation for scientific knowledge.

In deriving laws and theories from facts, hypotheses are first constructed, which are then tested, and if several tests confirm the hypotheses, such become theories, before they become laws. Indeed, once facts are obtained through observation, they are represented as statements, a class of which in the scientific enterprise of deriving knowledge constitutes hypotheses. As such, facts are represented as hypothetical statements, which are meant to be employed as a guide in the build-up of scientific knowledge, especially at the experimental stage. It is, however, pertinent to state here that, in relation to the formulation of hypotheses and the construction of theories, observation is central to the formation of knowledge in science. Indeed, observation and experimentation are central to the process of how knowledge is arrived at in science.

Scientific Theory

Scientific theories are the carriers of scientific knowledge. It is the attempt to systematically bind together the knowledge that one has of some particular aspect of the world of experience. The aim is to achieve some form of understanding, where this is usually represented in the forms of explanatory power and predictive fertility. As used in science, a theory is an explanation or model, based on observation, experimentation and reasoning, especially one that has been tested and confirmed as a general principle that helps to explain and predict natural phenomena. [27] Scientific theories represent an important discourse in understanding scientific knowledge.[28] To be sure, if any issue can be justifiably deemed central to the philosophy of science and its concern with knowledge, it is that of the nature and structure of scientific theories, together with the diverse roles theories play in our understanding of the nature of scientific knowledge; for theories are the vehicle of scientific knowledge, and, one in a way or another, become involved in most aspects of the scientific enterprise.

The traditional analysis, going back to the Greeks and most recently championed by such logical empiricists as Carl Hempel and Ernest Nagel, sees theories as 'hypothetico-deductive system', meaning that one has a set of laws

[27] Alex Rosenberg, *Philosophy of Science: A Contemporary Introduction, 2nd ed.*, (New York: Routledge, 2005), 69.

[28] The three most prominent approaches to the nature of scientific theory in the philosophy of science can be identified as the Received View, the semantic view and the Structuralist view.

bound together through the fact that, from a few high-powered axioms or hypotheses, everything else can be shown to follow as deductive consequences. Explanation, therefore, is a matter of showing how a thing happened, because of the law of the theory. Prediction is a matter of showing how things will happen in accordance with the laws of the theory. Most significant is the fact that successful theories bound together information from many hitherto disparate areas of experience, thus exhibiting what the philosopher, William Whewell, characterized as a 'consilience of inductions.' Besides the use of the term to name a whole area of inquiry, in science, "theory" is also employed as indicating a body of explanatory hypotheses for which there is a strong empirical support. Indeed, what is distinctive about a theory, as it is used in science, is that it goes beyond the explanations of particular phenomena to explain these explanations. That is, when particular phenomena are explained by an empirical generalization, a theory will go on to explain why the generalization obtains, as well as explaining the exceptions to the generalizations, the conditions under which it fails to obtain.[29] Theories, in short, unify, and they do so almost always by going beyond, beneath and behind the phenomena that empirical regularities report, to identify underlying processes that account for the phenomena observed.[30] Given the role that scientific theories play in the formation of scientific knowledge, it is, however, important to note that scientific theories are not to be considered as the result of the scientific method. This is because theories can be proven or rejected, just like hypotheses. They can also be improved or modified as more information becomes available so that the accuracy of the predictive power of the theory becomes greater over time.

Be that as it may, theories remain the foundations for furthering scientific knowledge and for putting the information gathered, at least at the early stage of the development of the scientific knowledge, to practical use. Though a further stage in the scientific method sees some theories becoming laws, theories and laws have separate and distinct roles in the scientific method. Whereas, a theory is an explanation of an observed phenomenon, a law is a description of an observed phenomenon.[31]

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[29] Philip Kitcher, "Theories, Theorists and Theoretical Change", In Yuri Balashov & Alexander Rosenberg (Eds.), *Philosophy of Science: Contemporary Readings* (New York: Routledge, 2002), 167.

[30] Alex Rosenberg, *Philosophy of Science: A Contemporary Introduction, 3rd ed.* (New York: Routledge, 2012), 115-6.

[31] Kim Ann Zimmerman, "What is Scientific Theory?" http://www.livescience.com/21491-what-is-a-scientifictheory-definition-of-theory.html. Accessed 25th March 2014.

The Ontological Basis for Positivist Epistemology

Ontology deals with the study of being. It is always found as the foundational grounds for human thoughts and actions: inquiries, policies, decisions and implementations. The project of knowledge is not an exemption. What is referred to as positivist epistemology, therefore, rests on a particular foundation of metaphysical structure, which is materialism. In other words, a theory of reality underlying the epistemology of the empiricist's orientation is materialism, along with its cognate ideals, such as empiricism in epistemology, realism, mechanism, experience and observation. What this means is that underlying the epistemology of the empiricists' orientation is the belief that what is real is essentially matter and its character, content and scope. To be sure, materialism has to do with the disposition that all events, in reality, are guided by some general laws. These events include human actions going beyond natural phenomena. By this understanding, what is to be known or knowable must be material and materialist. Any other contrary conception of reality does not agree with the empiricist epistemology. What this means is that every event obeys certain laws and principles, and must follow certain procedures that are realist, observable, calculable, experimentable, and so on; otherwise, such would not qualify for an object of knowledge. Human emotions, psychologism, economy, politics and other forms of natural sciences, as well as applied discourses in science, must be understood in the light of materialism. The universe, as it begins from a materialist evolution, and human actions have purposes only calculable and inter-subjectively verifiable.

The implications tied to this orientation are obvious; first, everything, in reality, is organized according to certain laws and mechanistic procedures; therefore, two, there can be no factor of 'will' in a scheme of things. Three, there is no place for a non-material source that brings forth resources. Four, even human actions are not free, but determined. So, humans are not responsible for their actions and cannot be held responsible for them.

Conclusion

In the light of the foregoing, it is difficult to argue for the a priori reasonableness and intelligibility or necessary truth of science and scientific knowledge. Scientific knowledge must remain contingent, but not necessary. *Aposteriori*, not *a priori*; matters of fact, not of value. Matters of 'is' questions rather than 'ought'. And above all, simply descriptive, not normative. For this very reason, it is difficult to establish the normative status of positivist epistemology.

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