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Reductionism and Quine's Holism: A Critical Review

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Abstract

Reductionism is one of the two central tenets of logical positivism. Logical positivists, namely, Carnap, Neurath, etc. admit reductionism in addition to the verification theory of meaning to explain the meaning of non-observation statements. According to reductionism, a meaningful non-observation statement can be reducible to some observation statements, and a meaningful non-observation statement is equivalent in meaning to a conjunction of some observation statements. Quine holds that logical positivists cannot consistently admit reductionism. For, they admit reductionism to explain the meaning of non-observation statements. But the notion of non-observation statement is not an empirical notion. For this reason, Quine holds reductionism is a dogma of the logical positivists. Quine holds that the empiricism of logical positivists' is based on a false view about science or theory, and it is the source of both dogmas of their empiricism. According to them, the theory or science is a combination of some separate statements which are individually meaningful. On the other hand, Quine holds that the theory or science is a combination of some interrelated statements. The meaning of any statement can be determined on the basis of the significance of the theory or science as a whole. Thus, Quine admits holism to establish dogma free empiricism or radical empiricism. For him, 'The unit of empirical significance is the whole of science.' In this article, I have critically explained, firstly, why do logical positivists admit reductionism, secondly, I have explained Quine's arguments against reductionism in terms his holism, and lastly, I have tried to evaluate critically Quine's holism.

Keywords: *Logical positivism, Reductionism, Non-observation statements, Holism, Science as a whole, Revisability thesis, Conceptual scheme.*

Introduction: Quine in his 'Two Dogmas of Empiricism' uses the term 'empiricism' to mean logical positivism. Logical positivism is a philosophical doctrine and also a philosophical movement which started its journey from the conference of a group of

philosophers and scientists known as the Vienna Circle held in 1922 under the leadership of Professor Moritz Schlick. Two central tenets of logical positivism are:

- (i) The doctrine of the distinction between analytic and synthetic statements; and
- (ii) Reductionism.

Quine holds that these two central tenets of the logical positivism are two dogmas of empiricism.

Section-I

Logical positivists formulate the verification theory of meaning to explain the meanings of synthetic statements as factually significant statements. Schlick says, 'the meaning of a proposition is its method of verification'. In this context, the term 'proposition' is used to mean synthetic statement and the term 'verification' is used to mean checking by observation. A statement is factually significant if it is empirically verifiable, that means, there are some empirical means by which its truth-value can be determined. But logical positivists recognize that there are some meaningful statements which cannot be empirically verified, e.g., the general laws of science, statements about past, etc. These statements are non-observation statements. To solve this problem, some logical positivists namely, Carnap, Neurath admit reductionism to explain the meaning of such non-observation statements. They hold that non-observation statements like general laws of science, statements about past are also factually significant for they can be reducible (or translatable) into some observation statements which are empirically verifiable. Thus, for reductionism, a meaningful non-observation statement is equivalent in meaning to a conjunction of some observation statements. Reductionists hold that observation statements are basic statements, which are called by Carnap *protocol* statements. These statements are about one's own immediate experiences, and are directly and conclusively verifiable. Basic statements provide foundation of the verification of any compound factual statements. That means, any compound factual statement which is called non-observation statement can be reducible to some basic statements, and on the basis of the direct verification of basic statements, we can determine the truth and falsity of any non-observation factual statement. The basic statements constitute the '*natural terminus*' of the process of verification. So, reductionism is a kind of foundationalism.

Section-II

Quine holds that logical positivists cannot consistently admit reductionism. For, they admit reductionism to explain the meaning of non-observation statements. But the notion of non-observation statement is not an empirical notion. That means, the admission of these statements leads us to go beyond experience. Logical positivists being empiricists cannot admit any unempirical notion. For this reason, Quine holds reductionism is an unempirical dogma of the logical positivists. For him, this dogma is intimately connected with the

dogma of the distinction between analytic and synthetic statements, and these two dogmas are identical in origin.

Quine points out that, logical positivists admit two dogmas as two basic tenets of their view because their empiricism is based on a false view about science or theory. According to logical positivists, the theory or science is a combination of some separate statements which are individually meaningful. The truth of each empirical or observation statement can be considered in isolation, each of them can be separately checked against an appropriate set of possible experience and in terms of those experiences the meaning of a statement can be determined. Quine says,

‘The dogma of reductionism survives in the supposition that each statement, taken in isolation from its fellows, can admit of confirmation or infirmation at all. My counter suggestion...is that our statements about the external world face the tribunal of sense-experience not individually but only as a corporate body.’¹

On the contrary Quine, following Duhem, holds that the theory or science is a combination of some interrelated statements. The meaning of any statement can be determined on the basis of the significance of the theory or science as a whole. Thus Quine admits holism to establish dogma free empiricism or radical empiricism.

Quine argues against reductionism and verificationism as theories of meaning and he gives an outline of his holistic theory of meaning to establish his radical empiricism. According to Quine, an individual statement does not have any meaning or significance by itself. Only science as a whole, i.e., the total system of our knowledge and belief can have significance. Quine's theory is that meaning or significance of science as a whole depends upon both language and extra-linguistic facts, but in case of individual statements, the duality of language and extra-linguistic facts has no significance, because ‘... our statements about the external world face the tribunal of sense experience not individually but only as a corporate body.’²

According to Quine, statements are never individually confirmed by empirical evidence. Empirical data can confirm the significance of the whole of science and thereby confirm the significance of the statements occurring in it. The meaning of a given statement, or its significance, according to this view, is not some determinate characteristic which a statement carries around with it, because the significance of a statement is a matter of observational consequences which belong to the totality of science and not to any individual statement. ‘The unit of empirical significance is the whole of science.’³ Therefore, what a given statement means or signifies is determined by the nature of the remainder of the science of which it is a part. By the term ‘science’, Quine does not mean any particular branch of science. For him, ‘the whole science’, is the totality of our knowledge and belief, ‘... from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic’⁴. Following Neurath's simile that science is like a ship and our position is like that of a mariner, ‘who must rebuild his ship plank by plank while continuing to stay afloat on the open sea’⁵, Quine explains that our

science is a body of system constituted of several statements. On the outer part of the body of science, 'the periphery', there are observation statements. The relatively interior part of the body of science consists of non-observation statements or theoretical statements or statements which are laws of physical science etc. Finally, in the centre of the system, there are laws of logic. In the face of recalcitrant experiences, we may have to revise some of the observation statements which are in the outer part of the system, i.e., the periphery. This revision may also lead us to make a revision in the interior part of the system, since all the statements of the body of science are logically linked up with one another. This process of revision or reevaluation of statements is such that in revising a statement we have to revise some other statements also which are logically connected with it, and sometimes, if the situation demands, we may even have to reevaluate our statements regarding logical relations, i.e., the laws of logic. Thus, Quine holds that no statement in our science is completely immune to revision, and which statements are to be revised in the face of a recalcitrant experience depends on our decision. He writes, 'Any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system. Even a statement very close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws. Conversely, by the same token, no statement is immune to revision. Revision even of the logical law of the excluded middle has been proposed as a means of simplifying quantum mechanics.'⁶

Thus the significance of any statement of the totality of our knowledge and belief, i.e., science as a whole ultimately depends somehow on experience as a part of it.

Section - III

The theory of meaning put forward by Quine in 'Two Dogmas of Empiricism' is at the same time holistic and empirical. According to this view, the unit of meaning or significance is the total theory, i.e., the totality of our knowledge and belief. The significance of any sentence of a particular system has to be understood only in the context of the system as a whole. Quine's theory of meaning is also empirical in the sense that the significance of any sentence of a particular system is somehow dependent on the effect that experience has on it. In the same article, we also find two other important theses of Quine: (1) no sentence is immune to revision and (2) any sentence can be considered to be true come what may if we make drastic enough changes elsewhere in our system.

But these theses taken together overturn Quine's metaphor of periphery and interior of a system.⁷ If in the face of a recalcitrant experience any sentence of the system can be chosen for revision (depending on the purpose of the moment) and any statement wherever necessary (even a statement belonging to the periphery) can be protected from being revised, then there is no periphery, no interior. Moreover, Quine sometimes writes that the system faces 'the tribunal experience only as a whole', in such a case it does not make any sense to speak of the periphery and interior parts of a system.

Quine sometimes writes that whether a statement belongs to the periphery or not can be determined by the 'relative likelihood' or probability of its being revised in the face of a recalcitrant experience. Now the question may be asked whether the 'relative likelihood' of choosing a statement for revision (in the face of recalcitrant experience) is to be derived from the significance of the theory as a whole or it is to be considered as a primitive part of any systematic account of the significance of the theory.

The latter alternative would not be acceptable in a Quinean system, because, on this alternative, a particular statement having the highest probability of being revised would confront experience *individually*; and since the statements of a particular system are related to each other logically, it would play an important role in determining the empirical significance of the other statements of the system or the system as a whole. This is not in accordance with his thesis that the theory confronts experience and also has empirical significance as a whole.

According to the first alternative, however, the probability of choosing a particular statement for revision in the face of a recalcitrant experience may be derived from the significance of the theory as a whole. But in order to know the significance of a theory as a whole, one must know the relations of different statements to experiences, i.e., whether a statement belonging to the theory is confirmable to a particular experience or not, and if it is not, how it is to be revised, as well as the rules governing the logical relationship between the statements of the system which are also parts of the system. For Quine, those rules also may be revised under a heavy enough impact from without. But if even the logical laws governing the interconnections of statements of a theory are held to be parts of the theory and also revisable then they are to be revised following some other (superlogical) laws which would again be parts of the theory (and equally subject to revision). More generally, any statement regarding the significance of the theory, for example, a statement regarding what experiences are conformable or recalcitrant to a particular theory or a statement regarding the logical interconnections between different statements of theory, would be just another statement of the theory and therefore, would not have any meaning (since no statement by itself has any significance) unless the significance of the theory as a whole is known beforehand. Moreover, on this type of interpretation a Quinean theory would have to face other problems for not making a distinction between object-language and meta-language.

However, Quine's revisability thesis may not be interpreted in this way. The thesis truly shows that whether we would adopt a particular conceptual scheme or not might depend on our choice, there is no necessity about this adoption.⁸ It is not necessary that we should adopt a particular interpretation which would make a statement analytic or logically true, we may also decide to adopt any other interpretation. But this is one way of speaking about revisability of statements, a quite different way of speaking about revisability is to say that even when we are concerned with a particular conceptual scheme (or a particular interpretation) no statement can be held to be true by virtue of the linguistic convention or

true by virtue of the logical laws of the scheme. Quine's thesis of revisability of statements, however, is not to be understood in the latter way.

In this connection we may mention Antony Quinton's view. According to him, at least some principles of logic should be allowed to have a special status and the difference between them and the laws of nature should not be only a matter of how much centrally they are placed in a scheme. Quinton says, 'Unless some special status is given to at least some truths of logic, perhaps only the law of non-contradiction, it is hard to see how revision ever gets called for. All swans are white, we start off with. Oh, here is a black swan. What of it? Well, if all swans are white there are no non-white swans, and a black swan is a non-white swan, so there is a non-white swan and also there are no non-white swans. That is an explicit contradiction and is, as it were, where to stop. If we were to go on: there is a non-white swan, there are no non-white swans, it is not the case that there is a thing of a given kind and nothing of that kind, there would be no reason to call a halt anywhere. What we see as a collision, and incompatibility, requires as not just to assert logical truths but to use them inferentially. And there were other embedded, operative inferences in the chain of assertions about the color of swans, as revealed by the occurrence of the word 'so', which covers the moves to 'There is a non-white swan' and to 'There are no non-white swans.'

I do not think it can be proved that anything other than the law of non-contradiction is indispensable, rather than is never, reflectively, dispensed with. But to regard logical truths in general as on a par with the most comprehensive laws of nature, as Quine's holism does, fails to take account of the fact that either we accord some statements in the whole a special, inferential status or no element in the whole is, so to speak, relevant to any other.'⁹

In response to Quinton, Quine says, 'Tony feels that logic, the law of non-contradiction anyway, needs a separate status. What I see are degrees of centrality: dropping some of our theoretical tenets would disrupt and impair the system more than dropping others. Non-contradiction is just an extreme case; without it we would be left making mutually contrary predictions indiscriminately, thus scoring a poor ratio of successes over failures.'¹⁰

He also says, 'There are statements which *we choose to surrender last*, if at all, in the course of revamping our sciences in the face of new discoveries, and among these there are some which *we will not surrender at all*, so basic are they to our whole conceptual scheme.'¹¹

Thus it may be pointed out that Quine does not deny that such statements are true by virtue of conceptual scheme or by virtue of meanings (within the scheme). These statements, which state the logical laws governing the scheme, are so central to the scheme that any revision of them leads us to adopt a new system or to impose new significance to constituents of system or theory.

Notes and Reference:

- ¹ W. V. O. Quine, 'Two Dogmas of Empiricism', in Quine's *From a Logical Point of View*, Harper & Row Publishers, New York, 1963, p. 41
- ² Ibid., p.41
- ³ Ibid., p.42
- ⁴ Ibid., p.42
- ⁵ W. V. O. Quine, 'On Mental Entities', in Quine's *The Ways of Paradox and Other Essays*, Random House, New York, 1965, p.210
- ⁶ W. V. O. Quine, 'Two Dogmas of Empiricism', in Quine's *From a Logical Point of View*, Harper & Row Publishers, New York, 1963, p.43
- ⁷ Cf. M. Dummett, *Frege: Philosophy of Language*, Duckworth, London, 1981, p. 593ff.
- ⁸ Cf. H. P. Grice and P. F. Strawson, 'In Defense of a Dogma', In R. R. Ammerman(ed.), *Classics of Analytic Philosophy*, Tata McGraw-Hill Publishing Ltd, Bombay, New Delhi, 1965, pp. 351-352
- ⁹ A. Quinton, 'Doing Without Meaning' , in R. Barrett and R. Gibson (eds.) *Perspective on Quine*, Blackwell, Oxford UK & Cambridge USA, 1993, p. 307
- ¹⁰ W.V. O. Quine, 'Comment on Quinton', , in R. Barrett and R. Gibson (eds.) *Perspective on Quine*, Blackwell, Oxford UK & Cambridge USA, 1993, p. 309
- ¹¹ W. V. O. Quine, 'Truth by Convention', in Quine's *The Ways of Paradox and Other Essays*, Random House, New York, 1965, p.95 (my emphasis)