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B.N. SEAL AND SOME LOGICAL ISSUES THROUGH THE EYES OF B.N. SEAL

Abstract

Though Acharya Brajendra Nath Seal was a versatile genius, in true sense of the expression, he wrote a little and what he wrote was not for all. His philosophy is known as the 'Synthetic Philosophy' as he, through his encyclopaedian knowledge, used to reconcile any issue whether it is concerned with philosophy or some other subjects. This paper is the exposition of two logical issues amongst which the first one is chiefly related to the validity and the relevance whereas the second one is concerned with Mill's canons of induction especially, the joint method of agreement and difference along with a brief sketch of the activities done by the Acharya through out his life.

Keywords: validity, relevance, reconcile, formal, material, *pañchakārani*

Though the term truth has been conceptualized in different ways; we all, at least, realize what is the meaning of the term truth, believe each subject is meant for searching the truth whether directly or indirectly; and, finally,settle the aim of life for searching the truth. Concerning the logical truth, the Western logicians talk about the formal truth as well as the material truth and these two types of truths, for them, belong to twoseparate exclusive categories. As a consequence, we have been taught by the Western logicians, two types of logic—deductive and inductive. Aristotle, in his, 'Prior Analytics' discussed about deduction, whereas in the 'Posterior Analytics' explained different types of Inductions and their needs in order to establish different types of universal propositions. Though Aristotle never denied the distinction between deduction and induction, he thought these two types of logic werenot only closely connected to each other but also complementary. For him, the induction is the basis of the deduction as the deduction starts with the universal proposition which is established by none other than the induction.

But problems start, regarding the validity, when the issue of relevance is being shot for. Validity, being the basis of a deductive argument, refers to only that argument where there is no possibility of the premises are to be true and the conclusion is to be false. In this notion of validity, any conclusion whether it is true or false, may be derived from the self-contradictory premises and thereby the relevance of a deductive argument comes under the question mark? Though the Western logicians have been, somehow, managed to get rid of this problematical issue either by considering that relevance can never be the part of

deductive logic, because validity is concerned only with the truth value which is restricted to formal not corporeal; or by developing a new kind of Relevance logic as like as Anderson or Belnap; the issue is still remained unsolved. The issue is still alive, because the source of this issue is lied elsewhere and this is nothing but the division between deduction and the induction itself.

The source of the problem has been detected, but the question is: how to resolve this issue? Acharya Brajendra Nath Seal, in his authentic book, 'The Positive Science of Ancient Hindus', though left some hints in order to resolve this prominent issue, the aim of this paper is not to be confined with this issue only, rather this paper will focus to answer some of the questions raised by Cohen and Nagel in their book, 'An Introduction to Logic and Scientific Method'against the claims—these are the methods of discovery and proof made by Mill regarding the canons of induction, especially, the joint method of agreement and difference, because the joint method of agreement and difference is also the basic scientific method of Indian system of enquiry as clearly mentioned by the Acharya, following these subsections:

I) A BRIEF LIFE SKETCH OF ACHARYA BRAJENDRA NATH SEAL
II) FIRST ISSUE& IT'S SOLUTION
III) JOINT METHOD OF AGREEMENT AND DIFFERENCE AS DEVELOPED BY MILL, ITS CRITICISM AND SOLUTION

(I)

A BRIEF BIOGRAPHICAL SKETCH OF ACHARYA BRAJENDRA NATH SEAL

Acharya Brajendra Nath Seal have had a struggling life from his childhood. When he was about only eight years old, being the second child among the four of his parents, lost his mother (Radha Rani), father (Mahendra Nath Seal) and his grand-father (Jagannath Seal). He was brought up by Kishori Mohon Nun who was his maternal grandfather. Kishori Mohon Nun felt very lucky to have them but he had not sufficient means for nourishing them. However, Acharya Brajendra Nath Seal started to be known as a jewel in mathematics from his student life at General Assembly Institution, presently known as Scottish Church College in Kolkata. The professors, at that time, used to meet with him for solving any mathematical problem. He was an active member of '*Sadharan Brahmo Samaj*' and one of the best friends of Swami Vivekananda though he was one year senior in respect of class to Swamiji but one year junior to in age. In college, they used to be engaged with the discussions of various philosophical as well as religious doctrines which were

concerned with the Truth.One day they met with Shri Shri Ramakrishna Paramhansa and spent a whole day at Dakshineswar. In 1902, when he was asked by Swamiji, in a letter, for chalking out a plan for social work, he, at once, made a positive response; but failed to complete this project due to the demise of his bosom friend. In 1884, at the age of twenty, he married Srimati Indumati who was also great seekers of knowledge and was fond of reading and appreciating Shelly, Byron, Keats, Wordsworth and so on and so forth. Unfortunately, he lost his wife after sixteen years of his marriage after leaving four children. In 1885, at the age of only twenty-one, he became the youngest principal of Morris College at Nagpore after starting his career as a professor at City College, Kolkata just at the age of twenty. A lot of eminent professors such as Lalit Kumar Mukherjee, Kali Krishna Banerjee, Satsih Chandra Mukherjee, Hiralal Haldar and so on worked under his principalship during 1887-1896 at Krishnanath College Berhampur, West Bengal.Buthis scholasticism reached to the European academicians through the International Congress of Orientalists organized at Rome (1899) where he read four papers—The Test of Truth, Origin of Law and Hindu as a founder of Social Science, Foundations of the Social Science in the Mythology of *Yask* and *Niruktas* with Greek parallel and a Comparative Study on Vaishnavism and Christianity when he had been in the chair of principal Coochbehar College appointed by Maharajah Nripendra Narayan. Later on, he became an active member of Indian National Congressand was closely associated with Bipin Chandra Pal, Bal Gangadhar Tilak, Chitta Ranjan Das, Rabindranath Tagore, Hirendra Nath Datta and Sister Nivedita. He was also acquainted with Sir Ashutosh Mookerjee, the then Vice-Chancellor of Calcutta University and Lord Curzon, the then Governor General as he was one of the active members of Simla Committee for the educational reforms of the Calcutta University. In 1905, he revisited again in Europe for four months to represent the India to the Europe in order to prove that the Indian philosophy and religion had a strong basis of practical reason. In 1911, he inaugurated the first Universal Race Congress in London where he delivered a thought-provoking lecture on the Origin of Race. It was so learned and profound, following the report of Sister Nivedita, it attracted the attention of all the scholars presented in that occasion. In 1913, he joined in the post of the King George V Professor of Mental and Moral Science of the University of Calcutta in order to pay the honor of the invitation made by the then hon'ble Vice-Chancellor—Sir Ashutosh Mookerjee. Here he was included as a member of Ashutosh Committee and Sadler Committee which were founded to recognize the universities. However, he had to left the Calcutta University in

order to join as the Vice-Chancellor of Mysore University where he spent about ten years from 1921 to 1930. During this period, he reformed the constitution of Mysore and was honored as '*Rajatantra Pravin*' by the Maharaja of Mysore. He was also elected as a member of the Legislative Assembly of Mysore State. For his dedication and supremacy of knowledge, he was conferred Knighthood in the University of Bombay, in 1926. Due to the huge pressure of works, he had to be returned from Mysore to his own house in Calcutta after 1930. However, he attended his 72nd birth anniversary function on December 19, 1935 organized by All Indian Philosophical Congress at the Senate Hall, the University of Calcuttawhen he was seriouslyit. His last public appearance, was, in 1938 when he presided the meeting for the Parliament of the Religions in the Calcutta Town Hall on the occasion of the Ramakrishna birth-centenary celebration. His soul departed on December 03, 1938, in his own residence 78 Lansdowne Road, Kolkata.

(ii)

FIRST ISSUE & IT'S SOLUTION

Before delving the solution of the first issue, let us resume the issue once again with the help of a valid argument. The conclusion—'The earth is round.' could easily be derived from the premises—'Sourav Ganguly is the president of ICC.' and 'Sourav Ganguly is not the president of ICC.', because these premises are self-contradictory and any conclusion whatever it may be could be derived from a set of self-contradictory premises. The structure of this argument is as follows:

Sourav Ganguly is the president of ICC.
Sourav Ganguly is not the president of ICC.
∴The earth is round.

Here the argument is valid and it is valid in the ground—it is not the case that the premises are true and the conclusion is false, but it is a fact that there is no connection between the shape of the earth and the president of ICC. This is absurd and this absurdity, for some logicians, lies in the fact, when a valid argument is failed to prove any connection based on relevance whether it is causal or semantic between the premises and what is derived from the premises. Orlov, Moh, Church, Ackermann, Anderson and Belnap marked this absurdity as "Scandal in Philosophy" and proposed to consider relevance as a necessary

condition of validity and hence, any argument that fails to satisfy this condition must be invalid.

But the classical logicians overruled the objection imposed by the relevance logicians on the following grounds:

First of all, the concept of relevance is not only ambiguous but also subjective whereas the concept of validity is purely objective. Secondly, in case of validity or entailment(A entails B, B entails C, therefore, A entails C), the concept of transitivity will be remained intact, whereas the concept of transitivity is not guaranteed in case of relevance (A is relevant to B, B is relevant to C, it is not necessary that A is relevant to C). Thirdly, 'fallacy of irrelevance' has to be introduced, if the relevance of a valid argument is taken into consideration, but this is situation based and goes against the objectivity. Fourthly, following the law of identity a proposition is implied by it self i.e., p implies p is always true. But it is absurd to say a proposition is relevant to itself, because nothing is considered as self-relevance. Fifthly, the concept of relevance admits the concept of degree, but the concept of validity is devoid of any kind of degree.Finally, the classical logicians claimed that the relevance logicians have been trying to find out the meaning connection between the assumptions and conclusions which is something over and above the truth value relation between sentences.

But the relevance logicians further argued against the classical logicians on the ground of the distinction between the investigation of logical notion and logical connection. The classical logicians are actually fond of different types synonymous logical notions such as deducibility, entailment, logical consequence, fully demonstrative reasoning, sound argument, valid inference, implication, content inclusion, conditionality, logical commitment and so and so forth, but an analysis of logical notions can never clarify the relation between premises and conclusion.

In fact, the debate between the classical logicians and the relevance logicians in Western logic, seems to be endless, because they have failed to trace out the source of the debatable issue. The source of the issue, as mentioned earlier, lies in the bifurcation between deduction and induction or in the formal and the material. But the Indian logicians never ever make any gap between deduction and induction, rather they have formulated the inference or the *anumāna* in such a way where the inductive generalization has been

certified by deductive particularity. For them, inference or the *anumāna* is the process of ascertaining that a thing posses as certain character neither on the basis of perception nor direct observation, but through the instrumentality or the medium of a mark which must be certified by an invariable concomitance or *Vyāpti*. Acharya Brajendra Nath Seal, in this regard said,

> The Hindu inference (*anumāna)* is therefore neither merely formal nor merely material, but a combined Formal-Material Deductive-Inductive process. It is neither the Aristotelian Syllogism (Formal-Deductive process), nor Mill's Induction (Material-Inductive process), but the real Inference which must combine formal validity with material truth, inductive generalisation with deductive particularisation. [1]

In order to get these points more clearly let us take a detail analysis on the concept of inference or *anumāna* following the Indian tradition. Following Indian logic, the inference or *anumāna* are two types *svārthānumāna* i.e., the inference is for oneself consisted of three propositions—1) *pratijñā*—the *probandum*, the statement of the proposition to be established e.g. Yonder mountain is 'fiery.' ; 2) *udāharana*—the general proposition, stating the invariable concomitance which is the ground of the inference—clenched by an example, e. g. Whatever smokes is 'fiery', as an oven.; 3) finally, *nigamana*, the conclusion, the *probandum* proved e.g. yonder mountain is 'fiery.' and *parathānumāna*i.e., in demonstrating to others comprised of five propositions—1) *pratijñā*—the *probandum*, the statement of the proposition to be established e.g. Yonder mountain is 'fiery.' ; 2) *hetu*—the reason, the ascription of the mark e.g. For it smokes.; 3) *udāharana*—the general proposition, stating the invariable concomitance which is the ground of the inference—clenched by an example, e.g. Whatever smokes is 'fiery', as an oven.; 4) *upanaya*—the application, the ascertainment of the existence of the mark in the present case e.g. Yonder Mountain smokes.;5)finally, *nigamana*, the conclusion, the *probandum* proved e.g. Yonder Mountain is 'fiery.'

Inference or *anumāna* whether it is *svārthānumāna* or *parathānumāna*, the proposition *udāharana*—the general proposition is very important, because here the invariable concomitance, the ground of the inference is represented along with the example from the real world. That is why, in Indian logic, the formal validity has been certified by empirical observation. To quote Acharya Brajendra Nath Seal,

[1]Brajendranath Seal: *The Positive Sciences of Ancient Hindus*, Longsmans Green & Co., London, 1915, pp.250-251

The Hindu Anumāna, it will be seen, anticipates J. S. Mill's analysis of the syllogism as a material inference, but is more comprehensive; for the Hindu *Udāharana*, the third or general proposition with an example, combines and harmonises Mill's view of the major premise as a brief memorandum of like instances already observed, fortified by a recommendation to extend its application to unobserved cases, with the Aristotelian view of it as a universal proposition which is the formal ground of the inference.[2]

The following example will be helpful to get the point clearly.

Yonder mountain is 'fiery.'
For it smokes.
Whatever smokes is 'fiery', as an oven. } Mill/Induction

Whatever smokes is 'fiery', as an oven.
Yonder Mountain smokes.
Yonder Mountain is 'fiery. } Aristotle/Deduction

(III)

JOINT METHOD OF AGREEMENT AND DIFFERENCE AS DEVELOPED BY MILL, ITS CRITICISM AND SOLUTION

John Stuart Mill, in his book, 'A System of Logic', 1843 introduced five methods of inductive inference which are called by him as 'canons of induction'. In present day, these cannons are still significant for the discoveries in biological, social and physical science. These canons are sometimes called as universal tools of scientific investigation. Mill demands that these methods are the methods of discovery as well as the methods of proof. Among these methods, joint method of agreement and difference is actually the combination of two separate methods—method of agreement and the method of difference.

Mill defines the method of agreement as—'If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstance

[2]Ibid. P-252

in which alone all the instances agree, is the cause (or effect) of the given phenomenon.'[3] Whereas, the method of difference has been defined by him as— 'If an instance in which the phenomenon under investigation occurs and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former, the circumstance in which alone the two instances differ, is the effect, or the cause, or an indispensable part of the cause, of the phenomenon.'[4] When these two methods are jointly applied, it helps the investigator to be surer than the application of these methods separately. Mill defines this joint method of agreement and difference as—'If two or more instances in which the phenomenon occurs have only one circumstance in common, while two or more instances in which it does not occur have nothing in common save the absence of that circumstance, the circumstance in which alone the two sets of instances differ, is the effect, or the cause, or an indispensable part of the cause, of the phenomenon.'[5]

In order to get the point clearly let us peep into the example shown by Irving M. Copi, Carl Cohen and Kenneth McMahon in their book, 'An Introduction to Logic'. To find out the potentiality of the Hepatitis A vaccine, Dr. Alan Werzberger, of the Kiryas Joel Institute of Medicine, and his colleagues recruited 1,037 children in a community of Hasidic Jews, Kiryas Joel, in Orange County, New York, ages two to sixteen, who had not been exposed to the hepatitis A virus, as determined by a lack of antibodies to the virus in their blood. Among these children half of them (519) were received a single dose of the new vaccine, and among those vaccinated children not a single case of hepatitis A was reported. But rest of the 518 children who were received the dummy doses, 25 of them became infected with hepatitis A soon after. Here themethod of agreement and the method of difference has been applied jointly. Those who were vaccinated were free from the infection, but in case of dummy-vaccinated children 4.82% were infected.[6]

Mill has been criticized neither on the formulation nor on the application of the method, but the claims which are put forwarded by him regarding the methods—these are

[3]Stuart, Jhon Mill: A System of Logic, Ratiocinative and Inductive (VIII Edition), Harper & Brothers Publishers, New York, 1882, P-482

[4]Ibid. P-483

[5]Ibid. P-489

[6]Copi, Irving M., Cohen, Carl., & McMahon, Kenneth: Introduction to Logic(XIV Edition), Pearson, Edinburgh, 2014, P-532

the method of discovery as well as proof of any scientific enquiry.[7]Cohen and Nagel in their book, 'An Introduction to Logic and Scientific Method' pointed out that these canons have some sort of reservations, because of the conditions which are to be satisfied. The method of agreement is applicable if and only if all the instances are unlike in every respect except in one, whereas, the pertinency of the method of difference depends on the condition that all the instances are alike except one.These conditions could be fulfilled only when the causal connections have already been established in some forms or others. In the previous example, the causal connection between the vaccine and the prevention from the contamination has already been established. That is why Cohen and Nagel said, 'We must therefore modify the formulation of the canon. The negative instances must be all of a type in which the phenomenon is capable of being present when the adequate conditions are supplied.'[8]

Acharya Brajendra Nath Seal, in order to appreciate the ancient scientific method of the Hindus, commented, from the perspective of the Buddhist, inseparableness or the non-disjunction of two phenomena never depended upon the mere observation of their agreement in presence or difference. In order to bring the fuel for fire, the ass is customarily employed and there may be no exception of the agreement of the presence of ass and the smoke, but this does not mean that the ass is the cause of the smoke. Again, in a hundred cases, it may be observed that there is no ass and no smoke i.e., the agreement in difference, but this is no warrant for concluding a relation of cause and effect between the ass and the smoke.

He further said, it was not the joint method of agreement and difference as applied by J.S. Mill, but the joint method of difference—*Pañchakārani*, formulated by the Buddhist could resolve the issue. Let us examine how *Pañchakārani* works.

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[7] What do the methods explained in the preceding sections actually do for us? John Stuart Mill believed that they were instruments with which we may discover causal connections;also that they were canons with which causal connections may be proved. On both counts he overestimated their power. Inductive techniques are indeed of very great importance, but their role in science is more limited than Mill supposed. From An Introduction to Logic (XIV Edition) by Irving M. Copi, Carl Cohen and Kenneth McMahon, Published by Pearson, Edinburgh, 2014, P-545

[8]Cohen, R Morris & Nagel, Ernest: *An Introduction to Logic and Scientific Method*, Routledge & Kegan Paul Ltd., London, 1949, P-260

'First step—The 'cause' and the 'effect' both are unperceived.

Second step—Then the 'cause' phenomenon is perceived.

Third step—Then, in immediate succession, the 'effect' phenomenon is perceived.

Fourth step—Then the 'cause' phenomenon is sublated or disappears.

Fifth step—Then, in immediate succession, the 'effect' phenomenon disappears.'[9]

The superiority of *Pañchakārani* in respect to the canon of Mill's joint method of agreement and difference lies firstly, the former starts where the cause and the effect are not appeared i.e., there is no scope of preestablished causal connection between two events whereas the latter as traced by Cohen and Nagel is applicable where the causal connection has already been established in some form or others; secondly, the former is the combination of both the Formal and Material approach while the latter advocates only the material aspect. Acharya Brajendra Nath Seal in this regard remarked,

> 'The *Pañchakārani,* the joint method of difference, has some advantage over J.S. Mill's Method of Difference or, what is identical therewith, the earlier Buddhist method; and the form of the canon, bringing out in the prominent relief the unconditionally and the immediateness of the antecedence, is as superior from a theoretical point of view to J.S. Mill's canon, and is as much more consonant than the latter to the practice of every experimenter, as the Hindu analysis of *Anumāna* as a Formal-Material Deductive-Inductive Inference is more comprehensive and more scientific than Aristotle's or Mill's analysis of the Syllogism (or Mediate Inference).'[10]

So, from the above, following Acharya Brajendra Nath Seal, it is clear that the Indian logic has a strong basis, it not only formal, but also material or in other words both deductive-inductive; and these are the reasons why some of the perennial issues in Western logic have been solved by the Indian logic.

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[9]Brajendranath Seal: *The Positive Sciences of Ancient Hindus*, Longmans Green & Co., London, 1915, pp.191-192

[10]Ibid. P-192