

The Logical Principles and Features of *Nyāya* and Aristotelian Syllogism

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Abstract

The objective of this article is to explain vitally the literature, structure, terms, objective, nature, description and science of inference (technically called 'anumana') as found in the Nyaya school of philosophy, and also to compare and contrast the different types of syllogistic inferences found in the Nyaya philosophy. Nyaya logic, 'Nyaya Sutra' and anvikshiki or tarkasastra (science of reasoning) are also discussed in this article. The classifications of inference into svartha and parartha; into purvavat, sesavat and samanyatodrsta; and into kevalanvayi, kevalavyatireki and anvayavyatireki are explained briefly. The concept of Vyapti is also explained. The components of a five-membered Nyaya Syllogism such as pratijna (proposition), hetu (reason), udaharana (example), upanaya (application) and nigamana (conclusion) are explained briefly. Finally, the caliber of the naturalistic Nyaya Syllogism is proved to be dated old enough with respect to the Aristotelian Syllogism.

Key Words: Anumana, Pratijna, Hetu, Udaharana, Upanaya, Nigamana, Paksa, Sadhya, Linga, Vyapti, Kevalanvayi, Kevala-vyatireki and Anvaya-vyatireki.

Introduction

Philosophy is a study to find the ultimate truth and to provide a final solution through various arguments. Worldwide the philosophical knowledge is distinguished by the thoughts of several societies concerning different places. In western countries, the concept of philosophy started during the later ancient periods. But, in India, philosophy is very ancient as the philosophers and their periods they lived cannot be traced out. In western countries, the main objective of philosophers was the objective world. But in India, antithetically philosophers concentrated on practiced way of living and the central theme of Indian philosophical systems was on 'Atman'. Atman played a vital role in determining the concepts of objective and physical world.

The outcome of Indian philosophy is purely based on Vedas, Upanishads, and Agamas which are considered to be very ancient books. Even though philosophy differs in context to different places and ages, generally they are classified into three major categories namely, metaphysics, epistemology, and axiology. All the nine schools of Indian philosophy follow this classification. Particularly, the Nyaya

school of philosophy deals mainly with logic and epistemology. Technically, the word 'Nyaya' means 'right' or 'justice'. The main feature of Nyaya is the syllogism or a speech of five-membered argumentation. It suggests the system to be predominantly intellectual and analytic.

Nyaya School of philosophy as founded by Aksapada Gautama is known as 'Nyaya Sastra'. It is also known as 'TarkaSastra' (the science of reasoning) and also as 'PramanaSastra' (the science of logic and epistemology). The explanation to Nyaya Sutra was given by Vatsyayana in his 'Nyaya Sutra Bhasya'. It explains the concepts of logic and epistemology of Nyaya philosophy is Anvikshiki, TarkaSastra, and Nyaya Vidhya. Even though Nyaya is identical to Vaiseshika in most of the principles; it differs concerning the principles of God in Vaiseshika philosophy. Also, the concept of moksha in Vaiseshika is analyzed and explained through the epistemology principle and ideology of Gautama. The pramanas are considered as the vital point. Gautama accepts only four pramanas through which to say, one can attain ultimate knowledge. But in this article mainly four on pramanas at inference.

Classification of Inference

Among the four *pramanas*, Gautama insists more on inference. 'Inference' literally means 'after knowledge'. The knowledge that results out of some other knowledge is inferential knowledge (*jnanakaranakam-jnanam*). The school of Nyayamade three types of classification of anumana and had dealt with them in detail.

based on causation
Svarthaanumana
Pararthaanumana

based on coexistence
Purvavat
Shesavat
Samanyatodrsta

based on the nature of vyapti
Kevala nvayi
Kevala-vyatireki
Anvaya-vyatireki

Nyaya has classified *anumana*(inference) in three modes. One mode of classification is based on causation, into *svarthaanumana* and *pararthaanumana*; another mode of classification based on coexistence, into *purvavat*, *shesavat* and *samanyatodrsta*; and one more mode of classification based on the nature of *vyapti* and on the methods of establishing it, into *kevalanvayi*, *kevala-vyatireki* and *anvaya-vyatireki*.

Inferences based on causation

Svarthaanumana

In the classification of inference based on causation, *svarthaanumana* forms the first stage. It is immediate of its kind. This kind of inference is based on psychology. This inference is meant for one's own sake. It aims at the knowledge of an unknown fact, for example, 'This hill has fire' from the known fact that 'there is smoke'. The knower reaches the conclusion for himself by relating the known fact to that of the minor premise 'This hill has smoke' and remembers universal relation existing between the fire and the smoke as 'All cases of smoke are cases of fire' and therefore arrives at the conclusion

‘Therefore, this hill has fire’. Here, ‘the hill’ forms the minor term (*paksha*), ‘fire’ forms the major term (*sadhya*) and the presence of ‘smoke’ forms the middle term (*hetu*).

Pararthaanumana

Pararthaanumana forms the second stage of inference based on causation. This stage arises as a result of convincing others regarding the conclusion arrived at. In this type of inference, the conclusion is justified through the justification of the middle term that leads to the conclusion, with suitable examples. A *pararthaanumana* runs as:

Pratijna – On yonder hill there is fire.

Hetu – Because there is smoke.

Udaharana – Wherever there is smoke there is fire (for example, kitchenhearth).

Upanaya – On yonder hill there is smoke which is invariably concomitant with fire.

Nigamana – Therefore, on the yonder hill there is fire.

In this *parartha* type of *anumana*, *pratijna* is the proposition needs to be proved. *Hetu* is the reason. *Udaharana* is the Universal proposition supported by an example. *Upanaya* is the application of the Universal proposition. *Nigamana* is the proven statement. In the *Nyaya'spararthanumana*, there are five propositions. However, there are three terms only, namely the minor term (*paksha*), the major term (*sadhya*) and the middle term (*hetu*).

In the Aristotelian logic, inference is not classified into inference for one's own self (*svārtha*) and inference for convincing others (*parartha*) as seen as in the case of Nyaya logic. Mediate inference in the Aristotelian logic is in the form of a three-membered syllogism.

Inference based on coexistence

In the classification of inference based on coexistence, Nyaya has classified inference into *purvavat*, *shesavat* and *samanyatodrsta*.

Purvavatanumana

In the *purvavat* type of *anumana*, a person passes on from the knowledge of the perceived antecedent (course) to that of the unperceived consequent (effect). For example, from the presence of the dark clouds the possibility of the unperceived rain is inferred. This inference is based on the universal concomitant causal relation existing between the antecedent and the consequent.

Shesavatanumana

In the *shesavat* type of *anumana*, a person passes on from the presence of the perceived consequent to that of the unperceived antecedent. For example, from the perceived rise of the water level in the river and its muddy water current the unperceived previous rainfall that is the cause for the consequent rise of the water level in the river and its muddy water current is inferred. This inference is based on the universal concomitant causal relation existing between the antecedent and the consequent.

Samanyatodrstaanumana

In the *samanyatodrsta* type of *anumana*, a person infers an unknown fact from the known fact which are not causally related. For example, the movement of a planet, say 'the Sun' for example, is inferred from its change in its position and one's repeated experience of this change in its position. This inference is based not on the universal concomitant causal relation existing between any two facts but on the points of similarity between experiences.

Inference based on the nature of vyapti

In the classification of inference based on the nature of *vyapti*, *Nyaya* has classified inference into *kevalanvayi*, *kevala-vyatireki* and *anvaya-vyatireki*.

Kevalanvayanumana

This type of inference is possible only where the middle term is positively related to the major term. In this type, the invariable concomitant relation (*vyapti*) is arrived at by agreement in presence (*anvaya*). For example,

All knowable objects are nameable.

Book is a knowable object.

Therefore, book is nameable.

Here, all the three propositions, namely, the major, the minor and the conclusion are of affirmative type and cannot be otherwise.

Kevala-vyatirekianumana

This type of inference is possible only where the middle term is negatively related to the major term. In this type, the invariable concomitant relation (*vyapti*) is arrived at by agreement in absence (*vyatireka*). For example,

No non-soul is animate.

All living beings are animate.

Therefore, all living beings are souls.

Here, there is no positive case of agreement in presence between the middle and the major terms. The positive instance of agreement could be seen only with respect to the minor term.

Anvaya-vyatirekianumana

This type of inference is possible where the middle term is positively as well as negatively related to the major term. In this type, the invariable concomitant relation (*vyapti*) is arrived at by agreement in presence (*anvaya*) as well as in agreement in absence (*vyatireka*). For example,

All cases of smoke are cases of fire.

This hill is a case of smoke.

Therefore, this hill is a case of smoke.

is a case of universal affirmative relation existing between the middle term and the major term and

No case of non-fiery object is a case of smoke.

This hill is a case of smoke.

Therefore, this hill is a case of fire.

is a case of universal negative relation existing between the middle term and the major term.

Comparing to the Aristotelian logic, this method stands to be the best method of discovering the invariable concomitant relation between the 'hetu' and the 'sadhya'. The method leaves no doubt in the mind of the observer.

Meaning of Vyapti

Vyapti is nothing but the logical ground of inference. It is the unchanging, invariable, concomitant relation existing between the major term (*sadhya*) and the middle term (*hetu*). With the aid of this invariable, concomitant relation the inference of the presence of the major term (*sadhya*) in the minor term (*paksha*) is possible.

The literal meaning of the term '*vypti*' is 'the state of pervasion or permeation'. It stands for the correlation between that which is pervaded (*vyapya*) and that which pervades (*vyapaka*). This means that the *vyapaka* is unconditionally present in all cases of *vyapya*. For example, fire which is a *vyapaka* is unconditionally present in all cases of smoke which is a *vyapya*. Whereas, the *vyapya* does not necessarily accompany the *vyapaka*. The reason here is that, the kind of relation existing between them is not of equal extension. The relation is of non-equipollent concomitance. That is, fire can be inferred from smoke and not smoke from the cognition of fire. this type of *vyapti* is known as '*visamavyapti*'. In cases of equal extension of *vyapya* and the *vyapaka*, when there is an equipollent concomitant relation, the *vyapya* can be inferred from the cognition of the *vyapaka* and the *vyapaka* can be inferred from the cognition of the *vyapya*. This type of *vyapti* is known as '*samavyapti*'. For example, 'All men are rational animals.' In this

the two terms 'men' and 'rational animals' are of equal extension. In this case, at the very sight of a man, one can infer that he is a rational animal. Similarly, at the very sight of a rational animal, one can infer that he is a man. In the case of *samavyapti*, both the subject and the predicate terms stand distributed. Vyapti therefore is an invariable and unconditional relation of concomitance between the *vyapya* and the *vyapaka*. There can be no instance in which the smoke (*vyapya*) is present without the fire (*vyapaka*). Vyapti, therefore is a universal, invariable concomitant relation existing between the middle and the major, free of any conditional factors (*upadhi*).

From the above discussion, it is clear that *vyapti* can be understood in two ways – affirmatively (*anvaya*) and negatively (*vyatireka*). For example, 'all cases of smoke are cases of fire' is the positive concomitant relation existing between the *vyapya* and the *vyapaka*. Smoke is always accompanied by fire unconditionally. 'No case of not-fire is a case of smoke' is the negative concomitant relation existing between the *vyapya* and the *vyapaka*. *Anvavyapti* is therefore a universal affirmative proposition whereas *vyatirekavyapti* is an universal negative proposition. Therefore, it is clear that *vyapti* is a universal, invariable concomitant relation existing between the middle and the major, which can be either of a positive type or of a negative type.

Ascertaining Vyapti

Vyapti being the universal relation between the *vyapya* and the *vyapaka*, the problem still lies in the method of establishing the relation between these two. In the statement 'all cases of smoke are cases of fire', the problem of induction lies in the method of establishing the relation between the smoke and the fire. The Nyaya method of ascertaining *vyapti* includes the following steps: 1. *Anvaya*, 2. *Vyatireka*, 3. *Vyabhicaragraha*, 4. *Upadhinirasa*, 5. *Tarka* and 6. *Samanyalakshana*.

Anvaya

Anvaya is a non-contradicted uniform experience of the co-presence of two things say for example, 'wherever there is smoke there is fire'. This cannot be contradicted as the presence of smoke is preceded by fire.

Vyatireka

Vyatireka is a non-contradicted uniform experience of the co-absence of two things say for example, 'wherever there is no smoke there is no fire'. This cannot be contradicted as the presence of smoke is preceded by fire.

Vyabhicaragraha

Vyabhicaragraha consists in the non-observation of any other contradictory exceptional instance. It should be either of the co-presence or of the co-absence of the fire in the presence or in the absence of the smoke only and not otherwise.

Upadhinirasa

Upadhinirasa is nothing but the elimination of irrelevant conditions (*upadhis*) that may affect the *vyapti*. An *upadhi* is that which is co-extensive with the major term and not with the middle term in an inference. Thus, when one infers the existence of smoke from fire, he relies on a conditional relation between fire and smoke since the fire is attended with smoke on the condition that it is fire from the 'wet fuel'. When smoke and fire are observed again and again under different situations, the conditions (*upadhis*) that are not essential are therefore detected and eliminated.

Tarka

Supposing that even after the elimination of the unwanted conditions (i) there still remain the doubts regarding the unconditionality and the universality of *vyapti*, then such doubts can be removed by *tarka*. *Tarka* is nothing but the argument that is based on the inconceivability of the opposite. In this method, the contradiction of a proposition is first assumed. Then, attempts are made to show that such an assumption as a result will lead to totally absurd conclusions. In *tarka*, the proposition 'all cases of smoke are cases of fire' can be indirectly proved by *tarka*. In this step, if the proposition that 'all cases of smoke are cases of fire' is false then it is contradictory to the proposition that 'some cases of smoke are not cases of fire' must be true. This means that there may be cases of smoke without fire. Whereas, this proposition that 'some cases of smoke are not cases of fire' contradicts the law of universal causation. It amounts to saying that there may be cases of smoke which are not cases of fire. It amounts to saying that there may be an effect without its cause, for it is the fire that is the sole cause of smoke. If at all, someone has the obstinacy to say that sometimes there may be the effect without its cause, he must be silenced by reference to the practical contradictions involved in his position.

Samanyalakshana

Samanyalakshana is a kind of perception in which a person directly becomes aware of all the instances (that includes all the three tenses) of a class through its universal. Even after sincere effort to rule out the irrelevant conditions (*upadhis*), there is a possibility of a contradictory instance that may arise in future. It is here that this special kind of perception is required. When the fire is perceived the universal 'fireness' is perceived and when the smoke is perceived the universal 'smokeness' is perceived. Hence, a person has got a direct knowledge of the *vyapti*.

Aristotelian Three-membered Syllogism

Etymologically, syllogism means 'taken jointly'. It appeals to reason and compels assent. A syllogism consists of three propositions in which a conclusion is arrived at from two premises. The conclusion is arrived at indirectly by comparing two premises. This is a process in which two terms (the minor term and the major term) are related by a third mediating term (middle term). The conclusion is arrived at by relating the major term and the minor term with that of the middle term. It is the middle term

that mediates the major term and the minor term. Syllogistic reasoning hinges on the middle term. For example,

Major premise: All living beings are mortal beings.

Minor premise: All human beings are living beings.

Conclusion: Therefore, all human beings are mortal beings.

This is a case of mediate inference. In this inference the major term 'mortal beings' appears in the major premise as well as in the conclusion and the minor term 'human beings' appears in the minor premise as well as in the conclusion. Also, the middle term 'living beings' appears twice in the major premise as well as in the minor premise.

Conclusion

Aristotle is considered to be the father of logic. Mediate inference in the Aristotelian logic is in the form of a three-membered syllogism. As in the case of Indian logic, inference is not classified in the Aristotelian logic into inference for one's own self (*svārtha*) and inference for convincing others (*parārtha*).

Also that, the methods of discovering the invariable concomitant relation between the 'vyāpāra' and the 'vyāpaka' is better than the Aristotelian method. The methods in Indian logic leave no doubt in the minds of the observers.

Moreover, it is very clear that, Aristotelian logic does not deal with inference as elaborately as in the case of the Nyaya School of philosophy.

Gautama, chronologically who lived before Aristotle had done a marvelous work in logic. Though there may be criticisms about the five-membered syllogism of Nyaya by the *Mīmāṃsakas* who consider that certain propositions are unnecessarily repeated and the *Advaitins* who consider that two are adequate, still Gautama's five-membered syllogism shows itself better than that of the Aristotelian three-membered syllogism. As the Italian philosopher Croce observes, the five-membered syllogism of *Naiyāyikas* is naturalistic as distinct from the somewhat artificial syllogism of Aristotle. The five-membered syllogism is in the form of a dialogue between two persons.

If at all any claim is to be made regarding the borrowing of ideas, then it is Aristotle from Gautama and not its vice versa or simply to end up with saying 'like-minded people think alike'.

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