VYĀPTI AND SETS

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INTRODUCTION

(a) Inference is a pattern of thought which is common to all members of a society and, in this sense, it is a social institution. Emile Durkheim postulated a social reality distinct from the physical and the mental realities and placed the collective ways of acting and thinking in this social reality. He explains his position in the following words:

"Collective ways of acting and thinking have a reality outside the individuals who, at every moment of time, conform to it. These ways of thinking and acting exist in their own right. The individual finds them already formed, and he cannot act as if they do not exist or were different from how they are.[1]

The *Nyāya Manjiri* (NM) in its somewhat naive fashion admits the social reality of inference.[2] It observes that even women, children, cowherds and farmers draw inferences. What it wants to point out is that inference, as a pattern of thought, is available even to those who are not trained for it. It further states.[3] That if we repudiate inference all social activity will come to a standstill. Therefore, we must accept the processes of inference as a social fact or a social institution.

(b) It is a frequent error to regard a social institution as a-priori and therefore immutable. It is more likely to happen in the case of inference. Since it is a pattern of thought available to every member of society and because every one conforms to it without there being any legislation to that effect, one is led to conclude that everyone is endowed with faculty of drawing inferences.

That inference very much depends on experience and that people adopt a pattern 'of thought' suitable to a particular situation is now an established fact

with a variety of logics in the field. The transformations which inference has undergone from the Aristotelian Syllogism to the present formal inference stand witness to the mutability of inference.

We submit that the anumāna which is the Indian variety of inference also underwent a transformation when the underlying concept of set changed from 'sāmānya' to 'jāti'. The need for this change in the concept arose because the logicians/scientists required a reliable conception of the vyāpti and vyāti is scooped up from experience. It is our observation that the Nyāya, the Indian Logic, remained in the shadow of experience and did not arrogate itself to mould the experience as the Western Logic did.

THE SĀMĀNYA

(a) When we look at reality we seldom find the presence of a uniform property in a body. Consider, for example, redness. Different shades of red are present in different bodies or even in the same body. How can we categorically say that a body is red? Further, the presence of the red colour in a body may not be permanent. Do we class a body as red if its redness is likely to vanish? Will we take a body as red if only a part of it is red? A variety of dfficulties presents itself when we attribute a property to an individual.

At this stage it will be instructive to discuss how a property or an attribute is abstracted from experience. We start with introducing a two-place predicate 'simlarity' among individuals. Two things are similar means they have some sense quality in common. A property is then defined as a set of things that resemble each other.[5] However, this definition suffers from the following lacuna. It may happen that the pairs (a,b), (c,a) may share three different qualities q_1, q_2 and q_3. In that case the set {a,b,c} will be a resemblance set in the above sense but it will not define a quality.

Perhaps, to overcome such a difficulty, Körner defined a resemblance set in terms of standard members and non-members.[6] Suppose we want to define whiteness. We then pick up an exemplar of whiteness, say, a swan, and collect all the objects that resemble a swan. Here it is understood that the whiteness of the swan is so predominant that for resemblance that quality is used as the exclusive criterion. Given an exemplar of whiteness one may think of an exemplar of the absence of white-ness, say, a crow, If we denote the resemblance set with a swan

as the exemplar by A^+, we may denote the one with a crow as the examplar by A^-

The resemblance sets appear in pairs, like (A^+, A^-). However the sets A^+ and A^- do not exhaust the universe. There may remain bodies which are neutral to both. They are neither in A^+nor in A^-. That is why the resemblance sets are inexact. There may also be some bodies which are initially neutral but which aspire to be either in A^+ or in A^-. In their case a decision will not necessarily be on objective grounds. It depends on the free choice of the author of these sets.[7]

(b) It is our thesis that initially the Nyāya structured the anumāna on the basis of the sāmānya which meant a resemblance set. We justify the thesis on the following grounds.

The Nyāya does not explicitly speak in terms of a shared property of sāmānya. The sāmānya gives the cognition that certain bodies are together.[8] It therefore appears that in the early stages of the evolution of its epistemology the Nyāya used the word sāmānya to indicate similarity which later came to signify a common property.

In formal logic the statement "$p \equiv a$ is /has P" has, as its negation, the statement "$-p \equiv a$ is/has not P". But the negation in the sense of the Nyāya will be "$p-\equiv P$ is absent in a". Now suppose $p \equiv A$ parrot is red." Then "$- P \equiv A$ parrot is not red" and "$p^- \equiv$Redness is absent in a parrot". Here the statement p and p- are both false but the statement - p is ture. Incidentally, this brings out a distinction between the formal logic and the Nyāya. In the formal logic both p and -p cannot be false, but in Nyāya p and p- can be false.

The Nyāya conception of negation is the 'atyantābhāva.' i.e.-the absolute absence of a property. A standard example of the absolue absence is that of the absence of colour in air.[9] The Nyāyakośa explains the term atyantābhāva as the absolute and all time absence of something or some property.[10] If we interpret the negation of p as p- then p and p- can both be false as in the case of 'parrot and redeness'; but both cannot be true.

It means that the sāmānya and its negation give in exact sets A^+ and A^-. If kitchen is the exemplar of the presence of fire and if we denote it by e^+, a lake is the exemplar of the absolute absence of fire and it will be denoted by e^-. Between the two extremes e^+ and e^- are arranged the several locations where fire is present with varying intensity. We then allot them to the classes A and A-d on various, often subjective, grounds.

That this interpretation of p and p⁻ is correct is supported by the conception of the 'samsāya' in the Nyāya. The saṁśaya arises when we have two alternatives regarding an object x : if something x before me is a man or a pillar. The two alternatives are not regarded as the negations, in the sense of p and - p, of each other. That is why the refutation of p does not validate the alternative.[11] After refuting p the debator deploys the pramānas to validate the alternative.[12]

(c) Let us now see how the anumāna operates under the dispensation of the resemblance sets. Let us recall the standard example of the anumāna of fire from the presence of smoke and the steps three and four in the parārthānumāna, namely, the udāharana and the upanaya.

The step called udāharana now includes both, the general rule i.e. vyāpti and the exemplar and the presence of both is puzzling. The statement of vyāpti should suffice for the conclusion and then the mention of the exemplar is superfluous. The function of the fourth step, the upanaya, is also intriguing. It says, "this (i.e. the smoke on the mountain) is like that (i.e. the somke in the kitchen.)". This camparison is rdundant in the presence of the general rule. This puzzlement can be abated or explained only in terms of the resemblance sets.

Matilal suggests that originally the anumāna operated on the basis of analogy alone[13] and the vyāpti was introduced later. Therefore, in early stages, the third step contained the exemplar only and not the vyāpti. The upanaya was in order because it established the analogy. Just as the kitchen somke was accompanied by the (kitchen) fire, the smoke on the mountain was accompanied by the fire on the mountain.

When the anumāna shifted its basis from analogy to the vyāpti it extended its domain from the exemplar to the resemblance sets. Let us see how this was brought about. We have to judge if there is fire on the mountain or not. We know that the smoke in the kitchen is accompanied by fire. The crucial step involves the decision that the smoke observed on the mountain carries fire with it. In fact, Uddyotakara states that what we infer is that this smoke on the mountain possesses fire.[14]

The rule 'where there is smoke, there is fire' is conceived as a resemblance set, say A, of the smoke individuals which possess fire. The exemplar of this set is the smoke in the kitchen. Now a candidate, say the smoke individual on the mountain, aspires to membership of A. Our decision will naturally be based on the

comparison with the exemplar. That is why the exemplar is mentioned in the udāharaṇa. Note that this camparison is subjective because we do not perceive fire which is expected to accampany the smoke.

THE JĀTI

(a) It is an accepted surmise that the Indian logic was closely connected with the practice of the Āyurveda. As the Āyurveda developed it introduced the method of classification by definitions. Vacaspati regards a definition as a means of supplying the property or unique evidence that distinguishes the desired object from what it is not.[15] It is true that the objects which the definition seeks to put together are already, in an imprecise manner, thought to be together. Thus, a definition makes precise what is already known.[16] Udayana mentions the practice of the Āyurveda in this connection. A physician observes certain symptoms in the patient and identifies the disease with the help of the defining character.

Our thesis is that the defining character was abstracted from the existing resemblance sets to make the inexact resemblance sets into precise jātis and the defining character was now called the sāmānya while the set came to be known as jāti. Here we find the second shift in the evolution of the anumāna.

Let us begin with the distinction between the 'go-jāti' and the 'gotwa-sāmānya.' Baralingay suggests that 'gotwa' is the principle or the characteristic of the division while 'go' is the entire quantity or universe of the bulls.[17] Goekoop, too, makes a similar distinction between 'forma cum subjecto' which stands for the jāti and 'forma sine subjecto' which refers to the sāmānya.[18]

(b) In the *NM* the discussion of the jāti begins with an obervation made by the mimāṁsaka that the word 'go' apprehends only the 'jāti' and not the individual belonging to it.[19] The Nyāya counters this by saying that when a speaker pronounces the word 'go', he refers not only to the jāti (i.e. the sāmānya) but an individual bull. Not this or that particular bull but rather a individual endowed with bull-hood. Later on the *NM* says, "Not a specific bull, say Śabaleya, since it is not mentioned, nor every bull individual in the world that is endowed with bull-hood; but some one whose specialities are un-specified and which is the location of bull-hood."[20] Thus we find that a jāti collects such individuals over which universal generalization[21] is possible.

We thus find that in going from the sāmānya to the jāti the Nyāya achieved two things. Originally, the sāmānya gave a resemblance set which was in-exact

and its membership was often decided on subjective grounds. In the jāti we have sets which were based originally on resemblance but they are now made exact by specifying the characteristic. Secondly, these sets are more cohesive and over them it is possible to make universal generalisations.

The *NM* goes further and says that a universal generalisation is not an abstraction put together by scooping up properties shared by all the individuals in the jāti.[22] An abstraction is conjured to avoid vyabhicāra (deviation) and infinity (ānantya). But a universal generalisation also overcomes these two difficulties. When we speak of 'a bull' in the sense of universal generalisation we mean not a particular bull but any bull shorn of his specificities. Therefore the divergences among bull individuals are glossed over. Slmilarly, the clan of bulls may include infinitely many bull individuals but in universal generalisation we speak of only one bull and therefore the difficulties presented by an infinite class are avoided. Thus, (i) the word 'go' refers to an individual bull whose specificities are ignored, (ii) it is not an abstracted bull but an unspecified one, (iii) the word 'go' as a universal generalisation overcomes the difficulties of divergence and infinity.

(c) Let us now examine how the 'jāti' is used in the anumāna. What Udayana says about the jātis is relevant in this connection. Firstly, Udayana says, a jāti cannot comprise a single element. 'Akāśa' by itself cannot form a jāti. This stipulation of Udayana underlines what we have alrealy observed, namely, that the jātis are by themselves resemblance sets. But they are neither inexact nor are they structured round exemplars. The membership is not based on comparison with the exemplar but it is conferred on the basis of the characteristic. Nevertheless a 'jāti' brings together objects which have something in common and this fact is emphasised by Udayana by laying down his first condition.

The second condition states that if A and B are two jātis then either $A \cap B = \emptyset$ or one of the two, viz, $A \subset B$ and $B \subset A$ obtains. The characteristics Bhutatwa and Mūrtatwa give us two groups of upādhis. But the two groups cannot be jatis for they have a proper intersection.

Now let us consider the standard example of the vyāpti, namely, 'where there is smoke there is fire.' Here we have two jātis namely those of the locations of smoke individuals and of fire individuals. The two jātis intersect on kitchen where we find a smoke individual and a fire individual together. Therefore, one jāti must be a subset of the other. Since a red hot iron ball has fire but no smoke, it is

the jāti of smoke individuals that must be a subset of the jāti of fire individuals. Clearly, therefore, 'where there is smoke, there is fire.'

The Upanaya then says, 'this mountain is like that kitchen' i.e. there are both smoke and fire on the mountain which leads to the conclusion that there is fire on the mountain.

CONCLUSION

(a) We began with the observation that the anumāna is a social institution and that it is not *a-priori* and immutable. With changing experience of reality the nature of the anumāna also changes.

We supported this observation by distinguishing two shifts in the nature of the underlying sets. Firstly, the anumāna depended on analogy. Just one instance of togetherness of smoke and fire was sufficient to conclude the presence of fire from that of smoke. The shift came when the vyāpty was introduced, which depended on resemblance sets. Second shift was from the resemblance sets to jātis. The jātis are more cohesive resemblance sets over which we can make universal generalisations.

These shifts occur in the period of the Prācina Nyāya. A third shift occured when the sāmānya came to be conceived as a universal. But because this shift occured in the period of the Navya Nyāya we have not dealt with it.

NOTES

1. Quoted in Harsh (1997) p 14.

2. *NM* II. p.317

3. *Ibid.*

4. Goodman (1977) p.106

5. *Op cit.* p. 107

6. Korner (1966) p. 20

7. *Op cit*.p 26

8. Harsh Narain (1976) p. 197

9. Ingalls (1988) p.55 and Shastry (1976) pp.402-3.

10. Zalakikar (1966) p.9

11. Bagchi (1953) 73-74

12. *NM* Vol II 584
13. Matilal (1985) p. 40
14. *Op. cit.* p.62
15. *Op. cit.* p.194
16. *Ibid.*
17. Baralingay (1976) p. 88
18. Goekoop (1967) p. 17
19. *NM* Vol II p. 51-53
20. *Op cit.* pp.59-60
21. Copi (1999) p.72
22. *NM* Vol II p.56

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