INFERENCE : DHARMAKIRTI AND HEMPEL

AMIT KUMAR SEN

I

In Indian logic inference is based on two factors - (1) invariable concomitance (vyāpti) between hetu and sādhya, and (2) Pakṣadharmatā, i.e. the presence of hetu in the pakṣa. An inference is sound when a hetu is pervaded by the sādhya, and when such a hetu characterizes the pakṣa. When these two conditions are satisfied, we are justified in claiming that the sādhya is present in the pakṣa. Vyāpti or pervasion may be expressed in two ways namely (i) Anvaya and (ii) Vyatireka. The former takes the positive form "Where ever there is hetu, there is also sādhya" and the second is expressed in the negative form "Whatever is characterized by the absence of the sādhya is also characterized by the absence of the hetu."

For Dharmakirti, the Buddhist logician, given the anvaya form of a vyāpti, one can construct the corresponding vyatireka form or vice versa. He also maintains that the universal generalization involved in the formulation of vyāpti connot be justified merely by repeated experience or repeated observation of the agreement in presence and agreement in absence between the hetu and the sādhya-while they are necessary conditions for grasping vyapti, they are not sufficient conditions for the same. Dharmakīrti points out that experience of mere agreement in presence and agreement in absence does not enable us to claim beyond reasonable doubt that there is an invariable concomitance between the hetu and the sadhya, because under such circumstances, we are not in a position to rule

out any exception to the universal concomitance between hetu and sādhya. The claim that whatever is characterized by hetu is also characterized by sādhya can be justified if it can be shown that it is impossible for the hetu to be present along with the absence of the sādhya. This can be shown if it can be shown that the hetu constitutes the very nature of the sādhya-that there is some essential identity between the hetu and the sādhya. The essential identity is called tādātmya, and in such cases the hetu is called svabhāvahetu. Vyāpti can also be established beyond doubt if the hetu concerned is the effect of sādhya and this vyāpti relation is called tadutpatti. In such cases the hetu is called kāryahetu. In both these cases, denial of vyāpti leads to contradiction is some form or other. In both tādātmya and tadutpatti vyāpti Dharmakīrti wanted to obtain a sort of necessary relation between the hetu and the sādhya, obviously in order to avoid the contingent character of an inductive generalization based on observation. The purpose of this paper is to compare Dharmakīrti's theory of inference with the notion of scientific inference found in C.G. Hempel, an eminent philosopher of science.
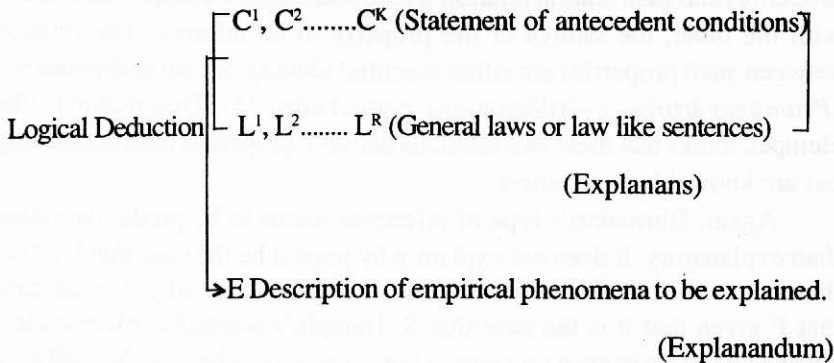
II

According to Dharmakīrti from these two types of vyāpti we may have three kinds of inference. One is based upon the identity between the hetu and sādhya, viz, 'it is a plant, because it is an ivy'. The inference is based here upon the fact that property of being an ivy can't characterize an object unless that object is also characterized by the property of being a plant. In other words, whatever is identical with an ivy is necessarily identical with a plant. An ivy can't be but a plant at the same time. The second type of inferences is based upon the causal relation between the hetu and the sādhya, viz. 'there is fire here because there is smoke here'. It is the nature of smoke that it can't but be caused by fire. So smoke can't be there without fire being there. These two types of inference are affirmative in nature. But in the case of previous one the two properties are in some sense identical, for whatever is an ivy is also a plant and in the case of latter, the two properties, smoke and fire, are non-identical but causally related. The third is the inference where that sādhya is absence of something

and this takes on a negative form. Viz, there is no pot on the floor, because had the pot been present there it would have been apprehended, and yet, it is not being apprehended'. Here the hetu is known as anupalabdhihetu. Dharmakīrti enumerated several varities of this type of inference. We shall not go in detail of this. Our concern here is to highlight Dharmakirti's contribution to the development of the theory of inference by comparing it with the notion of scientific inference by C.G. Hempel.

Hempel in his '*Aspects of Scientific Explanation*' illustrates his notion of scientific inference, the model of which could be written as:

<div align="center">Q because P</div>

This should be read as an assertion that 'P' is the case, and that there are laws, not explicitly specified, such that 'Q' follows logically from these laws in conjunction with the statement that 'P'. To take an example from Hempel: There is Rainbow because there are raindrops in the air and sunlight fall on these drops. Here, Hempel argues, the occurrence of the rainbow can be deductively explained by reference to certain particular determining conditions, such as the presence of raindrops in the air, falling of sunlight on these drops etc. along with certain general laws optical reflection, refraction and dispersion which are not explicitly specfied in the inference. He explains his theory of scientific inference in deductive nomological model in the following schema:

$$C^1, C^2........C^K \text{ (Statement of antecedent conditions)}$$

Logical Deduction $\quad L^1, L^2........ L^R$ (General laws or law like sentences)

<div align="center">(Explanans)</div>

E Description of empirical phenomena to be explained.

<div align="center">(Explanandum)</div>

Dharmakīrti's type of inference may be written in similar fashion as:

F because S

Here 'S' stands for hetu and must fulfill the following conditions.

(i)   All known S are known to be F and

(ii)   All known non-F are known to be non-S

The above shows that the condition is that S and F are known to be nomologically related. Similarly, Hempel's scientific inference answers the why-question, "why-E?" (E for explanandum which is a sentence that describes a known particular event of facta) by showing that E is nomologically expectable on the basis of general laws and antecedent conditions.

Again, Hempel denied any role whatsoever of induction in his scientific inference. According to him no rule can even guarantee that a generalization inferred from true observation however often repeated, is true. In the scientific inference he admits, the relation between the explanans and explanandum is a causal relation which holds necessarily but is knowable a-posteriori. Dharmakīrti was a naturalist in his approach to the solution of the problem of induction and argued that purely observation-based induction can never generate an inferential knowledge. To answar the problem of induction Dharmakīrti depends upon some natural relation between properties and such natural relation would make one, the hetu, concomitant with the other, the sādhya or the property to be inferred. The relation between such properties are either essential identity or causal dependence (*Pramāṇavārttika*, svārthānumaṇa pariccheda, 34). Dharmakīrti, like Hempel, thinks that these two relations between properties hold necessarily but are knowable ā-posteriori.

Again, Dhrmakīrt's type of inference seems to be predictive rather than explanatory. It does not explain why must it be the case that F rather than not in the inference: 'F because S'. It only states why it is the case that F given that it is the case that S. Hemple's scientific inferece also, because of its insistence on general laws, appears to have a close affinity to scientific prediction.

Thus we see that the line of thinking of Dharmakīrti and C.G. Hempel, is very close.

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Contact :   The Editor,
            Indian Philosphical Quarterly,
            Department of Philosophy,
            University of Poona,
            Pune 411 007