Some Remarks on the Navya-Nyāya Definition of Vyāpti

In the following I shall present one of the Navya-Nyāya definitions of vyāpti (pervasion), viz., the first definition in Gangesa's Vyāptipañcaka, and a few of Mathurānātha's refinements called 'insertions' (niveśanas) as contained in his Vyāptipañcakarahasya, and discuss the role of abhāva (absence) in the refinements as well as in the original definition. I have made extensive use of Ingalls's translation and notes on the above texts in his Materials for the Study of Navya-Nyāya Logic and also of his explanation of the concepts involved in these texts. In passing I will make some comments on the nature of the quest which Navya-Nyāya undertook in seeking an adequate definition of vyāpti and on some possible reasons for the technicalities in their discussions of that concept.

Knowledge of vyāpti is considered by Nyāya to be the cause of successful inference. So, according to Navya-Nyāya one ought to have a knowledge of what constitutes vyāpti in order to have a knowledge of what constitutes successful inference. Hence the study of vyāpti.

An older positive definition of vyāpti (mentioned in Guha: Introduction to Navya-Nyāya Logic) as the occurrence of hetu in what possesses sādhya (sādhyavat-vṛttitvam) suffers from the defect of over-pervasion (ativyāpti), i.e., it applies to cases to which it should not apply), and can make a faulty inference of the following type look true. (It is conventional to abbreviate inferences

in the form of the five-membered syllogism into a single statement which contains first the paksa, then the sādhya and finally the hetu. The faulty inference is, "There is smoke on the hill because there is fire." Here the above definition of vyāpti applies because the hetu (fire) does sometimes reside in the locus of the sādhya; yet we have a faulty (false) inference, because there may not be smoke on the hill even when there is fire on it.

The rationale for the Naiyāyikas in seeking an adequate definition of vyāpti is not just to preserve the validity of inferences but with soundness, because if it were to preserve validity the above enthymeme would not already be valid, which it is, particularly if you supply the missing major premiss, i.e., 'Wherever there is fire there is smoke,'even if it happens to be false. In order for the inference to be sound, the major and minor premisses of course have to be true. The truth of the minor premiss is given by perception, although one could be mistaken about it. It is the major premiss whose truth has to be secured, otherwise a sound inference does not result. How does one secure the truth of the major premiss against possible counterexamples is the nature of the quest of the Naiyāyikas. That is, the quest is how to define the relation between hetu and sādhya contained in the major premiss such that the major premiss always comes out true, if the conditions mentioned in the definition are met, and false if they are not met. In other words, the attempt is to arrive at the necessary and sufficient* conditions for the truth of the major premiss and incorporate them in the definition of vyāpti. It must be said that the attempts of the Navya-Naiyāyikas in this regard have been ad hoc, always additing further

See page 14 for the footnote.

requirements to take care of additional problems. My suspicision is (and I cannot prove this without further extensive research) that the attempts have not been entirely successful, perhaps because no set of formal requirements can ever guarantee the truth and unequivocalness of all major premisses.

At any rate, the Navya-Nyāya attempted to reformulate the above definition of vyāpti in terms of two absences and render it more precise and adequate. Gangeśa considers five alternative definitions of vyāpti. These definitions are not as much definitions of vyāpti as of a correlate (as I shall try to show below, logically equivalent) notion of avyabhicāritatva. The distinction, according to Ingalls is: "There is pervadedness (vyāpyatva) of b with respect to a when a is always found where b is found." And "there is nondeviation of b with respect to a when b is never found except in a locus of a." The first definition of avyabhicāritatva of hetu with respect to sādhya is that the hetu never occurs in any locus of the absence of sādhya (sadhyābhāvavat avṛttitvam). All the five definitions are rejected by Gangeśa as suffering from the defect of avyāpti (non-pervasion), that is, they are too narrow; they don't apply to cases of inference to which they ought apply. For example, it ought to apply to a true inference of the universal positive type (kevalānvayī) such as 'It is nameable because it is knowable.' Knowability according to the definition must not occur in the locus of the absence of the nameable. But the application contains an unexampled (apratisiddha) term, viz., the locus of the absence of the nameable. (According to Nyāya metaphysics there is

nothing which is not nameable). So the definition is defective because of avyāpti. Gangesa does mention another definition of vyapti in his Siddhāntalakṣaṇa which he considers to be free from this defect. The definition is, "Pervasion is hetu's having a common locus with sādhya where the sādhya is not the counterpositive of an absence residing in the locus of the hetu.' Ingalls surmises that this too requires several refinements before it can be considered adequate. It regulates the occurrence of the sādhya with respect to the hetu, while the other five definitions regulate the occurrence of the hetu with respect to the sādhya. All of Gangesa's have two absences occurring in them.

If the old definition of vyāpti (occurrence of hetu in what possesses sādhya) is modified in the form in which vyāpti is usually understood (viz., wherever hetu occurs sādhya also occurs), then it can easily be seen that Gangeśa's first definition is logically equivalent to the above modified positive definition, one being the contrapositive of the other:

All occurrences of hetu are occurrences of sādhya =

All occurrences of the absence (or non-occurrences) of sādhya are non-occurrences (or occurrences of the absence) of hetu.

So, the only thing that seems to be needed to tighten the old definition of vyāpti is to change the definition from 'Vyāpti is hetu's occurring in what possesses sādhya' to the definition, 'Vyāpti is hetu's occurring only in the locus of sādhya,' which is logically equivalent to both the above mutual contrapositives. It seems that since the Navya-Naiyāyikas lacked the conceptual equipment to state propositions with universal quantifiers they had to resort to talkin about the same notions through double absences. They don't seem to

have hit on the possibility of presenting the same idea without the universal quantifier and without utilizing double negation, viz., by means of the concept of 'only' as mentioned above, even assuming, as Ingalls states that for them statements combining 'all' and an expression equivalent to 'some' are impossible, for the terms of such a statement can always be missorted by sifting (calanīya nyāya), as for example, the statement "All bodies of smoke occur in a locus of fire," can be interpreted to mean that mountain smoke occurs on a plain and plains smoke occurs on a mountain. I don't see any ambiguity in the way I have expressed the universal proposition. The ambiguity might arise in Ingalls's formulation of it. At any rate, the problem, I think, can be circumvented by using the third alternative I presented above.

Once they started defining vyāpti (or avyabhicāritatva) by double absences, it is only a necessary consequence that the Navya-Naiyāyikas had to invent highly technical and involved expressions to take care of the problems that were generated from within their system and implied by their theory of absence. For example, problems arise if one does not specify what sort of absence one is talking about, whether generic or specific, or whether mutual or constant; what sort of relationship of the counterpositive to the locus is being denied as being absent; or how the counterpositive is qualified. Or, problems arise from within their theory of absence itself, as for example, if one ought to consider the constant absence of a mutual absence as 'essentially equivalent' to the counterpositiveness of the original absence or its counterpositive. Some of these problems, as for example, the ambiguity

in the sort of relationship a thing has to its locus might arise even in other formulations of vyāpti, but I think they could then be treated and dealt with as such without having to invent a whole network of technicalities. There seems to be no way of safeguarding oneself beforehand against all such possible ambiguities, as the Naiyāyikas were attempting to do. I think this possibly explains the ad hoc nature and technicality of the refinements of Mathurā-nātha on Gangesa's definitions.

In the following I shall try to illustrate the points I have made in the above paragraph as well as some of the highlights of the Navya-Nyāya theory of absence, by considering a few of the objections against the first definition and Mathurānātha's insertions vis-á-vis those objections.

Mathurānātha in his commentary considers each of Gangeśa's five definitions and offers refinements for each of them in the face of possible objections. For the first definition he puts in 12 insertions in order to take care of 19 possible objections.

Mathurānātha construes the first definition of non-deviation of hetu as "its property of having an absence of occurrence described by the locus of absence of sādhya." A possible objection to this has two parts: Part 1: If you accept this definition a false inference will appear true, as, e.g., in the inference, "The mountain possesses smoke because it possesses fire," the hetu fire does not occur in the locus of the absence of sādhya (smoke) where the locus of the absence of sādhya is specific, as for example, in a lake where there is no smoke and no fire. Part 2: Two entities

reside in fire (say, in a red-hot iron): 1. occurrence described by a locus of the absence of smoke (o); and 2. absence of waterness ($-w_1$). Therefore, in a red-hot iron there resides the conjoint absence of o and w_1 by virtue of the equivalence (o and $-w_1$) = $-$(o and w_1). This amounts to saying that in red-hot iron there is the occurrence of the absence of smoke (individually speaking) and at the same time there is the absence of the occurrence of absence of smoke (by virtue of the conjoint absence mentioned above), which seems to be a contradiction. The refinement called insertion 1 takes care of both parts of the above objection by insisting that the absence of occurrence to be a generic absence. That means hetu must occur in no locus of the sādhya (not just this specific locus). The lake is only one example of the absence of occurrence of fire, it is not the only locus. The second part of the objection is also taken care of because the formula of the conjoint negation cannot be generated because the occurrence of absence of smoke does not reside in all cases of fire. I think there is an ambiguity in the second part of the above objection, viz., that conjoint absence means absence of both the elements together and absence of them severally. The objection must be playing on this ambiguity or else I don't see how it is an objection. If this analysis is correct then Mathurānātha does not even have to reply to this part of the objection.

If we formulate the major premiss in the above inference as 'Fire occurs only where there is smoke,' or even as 'All occurrences of fire are occurrences of smoke," then the above objections cannot even be formulated; and the major premiss is false as shown by the

counterexample of red-hot iron where there is fire but no smoke. The objections can be formulated only on the double-absence formulation of vyāpti.

Objection 2 is against the first definition with the first insertion: "Where there is a valid inference such as 'It possesses fire because it possesses smoke' there is an occurrence of the hetu (smoke) by inherence in particles of smoke, which are the loci of the absence of sādhya (fire), and there is an occurrence of smoke by indirect temporal relation etc. in a lake etc. which is a locus of absence of fire." This objection is taken care of by Insertion 2 which says that "by occurrence must be understood occurrence by that relation which is the limiting relation of hetuness." The objection and the insertion are requiring the definition to be more precise than it is because a case has arisen where there are other sorts of relationships of occurrence between the hetu and the sādhya.

There is a choice here between clearing any vagueness or ambiguity that might arises case by case or qualify the general relation between hetu and sādhya further in the definition itself by specifying what is generally understood. The Navya-Naiyāyikas chose the latter option.

Objections 3 and 4 present a similar problem: Objections 3 & 4: "In the inference 'The mountain possesses fire because it possesses smoke' there is an occurrence of smoke by contact on a mountain which is the locus of a generic absence of fire by a relation of inherence etc. and which is the locus of specific absences such as those limited by this or that fireness, or by the conjoint

absence of fire and water." That is, the mountain is a locus of smoke by contact (objection 3:) where there is the generic absence (by inherence) of occurrences of fire and (objection 4:) where there is a specific absence by contact (limited by this or that fireness) or by the conjunct of fire and water.

Notice that here 'generic' and 'specific' absence are used in a different sense than in objection 1 and insertion 1. There a specific absence means absence in a specific locus. Here it seems to be used in the sense of a specific counterpositive. Similarly with generic absence.

Insertions 3 & 4: The absence of sādhya must describe a counterpositiveness which is limited by the limiting relation of sādhyaness and the limitor of sādhyaness. These insertions restrict the absence of sādhyaness by saying the definition must specify the limiting relation (whether inherence or contact etc.) of the counterpositive (fire) to the locus of the absence (mountain) and also specify the limitor of the counterpositiveness (the limitor here being fireness). So by requiring to specify that fire is absent in the mountain by the relation (say, in this case, by contact) it excludes the relation of inherence of the generic absence of fire in the mountain; and by requiring to specify that, say, fire is limited by fireness, it excludes the absence of specific fires such as Linda's-kitchen fire and also the conjoint absence of fire and water (because that is not limited by fireness).

With such insertions it becomes part of the Navya-Nyāya theory of absence that absence should be described by specifying its locus, its counterpositive, the relation limiting (or qualifying) the

counterpositive of the absence and the limitor (or qualifier) of the counterpositiveness. The relation between an absence and its locus is called absential particular qualification relation (abhāvīya viśeṣanatā viśeṣa saṁbandha, which is a svarūpa relation, that is, it does not require another relation to relate it to its locus.

Insertion 5 requires that the relation between the absence of sādhya and the locus of such an absence be what is called absential particular qualification. This takes care of objection 5 which says that the definition as amended by insertions 3 and 4 does not apply to valid inferences like 'It is a quality because it possesses knowledge' or 'It possesses reality because it possesses a generic character (jāti).' But insertion 5 generates another problem which will have to be solved by a further insertion (6).

Objection 6: When sādhya is negative, the absence of sādhya will be positive, as in the inferences 'It possesses constant absence of potness because it is a cloth,' and 'It possesses a mutual absence of pot because it is a cloth;' in such cases the absence of sādhya cannot enter into a negative relation of absential particular qualification as demanded by insertion 5, as for example, the constant absence of constant absence of potness or a constant absence of mutual absence of pot is potness which cannot enter into an absential qualification relation with its locus (only absences can). So, insertion 6 abandons the requirement in insertion 5 in favor of a more variable and general requirement. It says that the absence of sādhya must be related to its locus by that relation

only in which it subsists as the contradictory of sādhya. For example, in objection 5, if quality-ness resides in its locus by inherence, its contradictory, i.e. the absence of quality-ness, can reside in its locus by absential particular qualification only, and not by content-ness relation because of which alone knowledge-ness (hetuness) comes to reside in it. And when sādhya is negative then the absence of this negative will have the same relation to its locus as the relation limiting the counterpositiveness to the original negative. Insertion 6 also requires that the counterpositiveness in the absences must be described by the whole of sādhya (to avoid partial contradictories), and that in cases where sādhya is positive the counterpositiveness resident in sādhya and described by the absence of sādhya must be limited by sādhyaness.

The problems in objection 5 arose mainly because of the peculiarities of Nyāya metaphysics (or ontology) and its peculiar view of absence. For example, it is based on the idea that knowledge is a quality and that it is itself the locus of the absence of quality-ness by this peculiar relation called content-relation. Hence the need to specify the relation between the absence of sādhya and its locus.

In objection 6 two sorts of absences are mentioned: a) constant absence--e.g. potness being constantly absent in cloth; and b) mutual absence (e.g., cloth and pot are mutually absent in each other--this is the denial of essential identity).

Objection 8 states that according to the theory that $- \div$ pot $\div$ potness, if we follow insertion 6 then a true inference would appear false, as for example, in 'It possesses mutual absence of pot because it is a cloth'. Here the sādhya is the mutual absence of pot and absence of sādhya is essentially identical with potness,

and so the absence of sādhya cannot be a counterpositive to sādhya, nor can a relation like inherence be its limiting relation, because essential identity is its limiting relation. Mathurānātha replies to this by saying that no matter how we conceive the constant absence of mutual absence to be (whether it is potness or pot, for example), the constant absence of mutual absence of x must be a counterpositive of the mutual absence of x, and hence a relation like inherence must apply to it.

In the inference cited in objection 8 the sādhya is $\dot{-}$ pot; absence of sādhya is potness ($-\dot{-}$ pot); the hetu is cloth. The objection says pot is the c (counterpositive) of $\dot{-}$ pot but not potness.

Mathurānātha's reply is that although potness is the limitor of counterpositiveness of $\dot{-}$ pot, in so far as potness $\doteq -\dot{-}$ pot, potness is still the c of $\dot{-}$ pot and subsists by inherence.

Here we can already see problems starting to arise because of the dilemma whether $--x \doteq x$ or x_1 or $-\dot{-}x \doteq x$ or x_1.

Objection 9 states that although in other cases it is true that absence of constant absence is essentially identical to the counterpositive of the original absence, it is not true that an absence of the constant absence of difference from pot is essentially identical with pot; it is only essentially identical with constant absence of potness. According to the objection, this will have to be the consequence if one accepts $-\dot{-}x \doteq x_1$, (by substitution). Mathurānātha's reply to this objection is that the reason for claiming $--$ pot $\doteq$ pot is that wherever we perceive one we perceive also to the other occur. The same is true of the pair $-\dot{-}$ pot and $\dot{-}$ pot. He wants to say that(by quoting Udayana) if we don't accept that $x \doteq --x$ and insist that $--\dot{-}x \doteq -x_1$ then the c of $-\dot{-}x$ will

$-x_1$ and the counterpositive of $- \doteq x$ cannot be $\doteq x$.

Objection 10 draws the absurd consequences of admitting both types of equivalence, $- -x \doteqdot x$ as well as x_1. It says that if you admit that $- - \doteq x \doteqdot \doteq x$ and and $- - \doteq X \fallingdotseq - x_1$ then you must admit that $\doteq x \doteqdot - x_1$. Mathurānātha says that he has not actually admitted the consequence (which he should). He says, furthermore, there is no harm in admitting that $\doteq x \doteqdot x_1$, since tradition warrants it.

In 50.1 - 51.1 a further admission is made of this problem. Mathurānātha admits that $- \doteq x \doteqdot x_1$ just as $- \doteq x \doteqdot x$, which means that for him it is sometimes this and sometimes that. Only by such an admission can he solve the difficulty of cases where absence of sādhya is in the form of $\doteq x$, as, for example, in the inference, 'It is essentially identical with pot because it possesses potness.' The absence of sādhya here is a mutual absence. Absence of sādhya is the counterpositive of the absence of absence of sādhya ($- \doteq$ pot). If $- \doteq$ pot is potness only and not pot, then there is no counterpositiveness of absence of sādhya to sādhya. So $- \doteq x$ must be $\doteqdot x$ as well as x_1. That is how in this example there is in the absence of sādhya ($\doteq$ pot) a counterpositiveness to pot (s).

Ingalls shows the upshot of the discussion in the last couple of pages as follows: $\doteq$ pot occurs in all things that are not pots; $- \doteq$ pot occurs in all things that are pots; since $- \doteq$ pot occurs in all things that are pots and potness also occurs in all pots they are both essentially identical. That means $- \doteq x \doteqdot x_1$. But if we admit this, it will lead us into a difficulty. $- -x \doteqdot x$. Therefore,

$- - \dot{-} x \doteq \dot{-} x$ (by substitution).

c of $- - \dot{-} x \doteq - \dot{-} x$ and c of $\dot{-} x \doteq x$ (by definition of c).

Therefore, $- \dot{-} x \doteq x$.

Thus, $- \dot{-} x \doteq x$ just as $- \dot{-} x \doteq x_1$.

Thus the Nyāya theory of absence ran into problems perhaps because of its realism.

The Navya-Nyāya definition of vyāpti demonstrates ingenuity, logical rigor in its dialectics, and adhocness; and because of the last trait it also became unnecessarily cumbersome and technical.

Explanation of Symbols: (Following Ingalls)

c	'counterpositive'
$\doteq$	'is essentially identical with' (Essential identity is the limiting relation of counterpositive to muutal absence.)
$-$	'constant absence (of)'
$\dot{-}$	'mutual absence (of)'

The symbol '$-$' before sādhya or hetu may refer to either constant absence or mutual absence of the respective term. Where sādhyaness is limited by essential identity $-$ s (sādhya) is mutual absence; where sādhyaness is limited by any other relation $-$ s will be a constant absence. There are only a few examples of the former in the text of Mathurānātha.

Footnote for page 2: It might seem strange that the conditions should also be sufficient for the truth of the major premiss. Perhaps the Naiyayikas think so because the existence of the objects indicated by the terms is guaranteed by their theory of inference, and the rules of vyāpti, the satisfaction of which is ascertained by appeal to facts, guarantee that certain formal relations exist between the major and the middle terms.