PRAŚASTAPĀDA'S VIEWS ON THE 'ANTINOMIC REASON'
AND THEIR CONSEQUENCES
FOR A THEORY OF DEFAULT REASONING

Claus OETKE, Elmshorn

This paper deals with a short, but interesting passage within the section on inference in Praśastapāda's *Padārthadharmasaṃgraha*. The textual passage concerns fallacious logical reasons which – according to Praśastapāda – either in fact or allegedly constitute reasons for doubt. It runs as follows:

> "But [the logical reason] that occurs in the subject of inference and actually occurs as a common one both in that which is of the same and in that which is of a different kind as that (i.e. the subject of inference) is a doubtful one because it creates doubt, as if [one says:] 'Since it has horns it is a cow'. But some people [hold the view] that if two logical reasons which possess the stated marks [of correctness] and contradict [each other] with regard to one and the same [subject of inference] are conjoined they constitute another doubtful [reason] because doubt is observed [in such cases]. As for example the mind's possessing motion and being intangible for its being corporeal and incorporeal. Now, this is nothing but an uncommon (*asādhāraṇa*) [reason] because they cannot occur in combination in either *pakṣa* (i.e. neither in the *sapakṣa* nor in the *vipakṣa*) like invisibility and perceptibility and therefore it is an undetermined [reason], we will say. *Objection*: At various places in the Scriptures (i.e. the *Vaiśeṣikasūtras*) observation in both ways is declared as a reason of doubt. *Answer*: [This is] not [correct], because a doubt [originates] from the observation of a duality of realms. The observation of a duality of realms is the cause of the origination of doubt and [therefore] from the fact that both [reasons] contradict each other it would ensue that they do not produce a decision, but not that they are reason for doubt, if they were of equal force. But [as a matter of fact] it is not so that they both possess the same force because one of the two enunciations of the [thesis] to be proven is contradicted by tradition; this, however, constitutes nothing but a variety of contradicted [assertions]."[1]

1 PB (ed G. Kavirāj & D. Śāstrī 1983: 604-605) *yas tu sann anumeye tatsamānāsamāna-jātīyayoḥ sādhāraṇaḥ sann eva sa saṃdehajanakatvāt saṃdigdhaḥ, yathā yasmād viṣāṇī tasmād gaur iti / ekasmiṃś ca dvayor hetvor yathoktalakṣaṇayor viruddhayoḥ sannipāte sati saṃśayadarśanād ayam anyaḥ saṃdigdha iti kecit / yathā mūrtatvāmūrtatvaṃ prati manasaḥ kriyāvattvāsparśavattvayor iti / nanv ayam asādhāraṇa evācākṣuṣatvapratyak-ṣatvavat saṃhatayor anyatarapakṣāsambhavāt tataś cānadhyavasita iti vakṣyāmaḥ / nanu śāstre tatra tatrobhayathā darśanaṃ saṃśayakāraṇam apadiśyata iti / na, saṃśayo viṣayadvaitadarśanāt / saṃśayotpattau viṣayadvaitadarśanaṃ kāraṇaṃ tulyabalatve ca tayoḥ parasparavirodhān nirṇayānutpādakatvaṃ syān na tu saṃśayahetutvam / na ca tayos tulyabalavattvam asti anyatarasyānumeyoddeśasyāgamabādhitatvād ayaṃ tu viruddhabheda eva /*

II

The above quoted passage contains two parts: 1) A section dealing with the explanation of the category of the doubtful fallacious reason, as it is acknowledged by Praśastapāda. 2) A section dealing with an alleged variety of doubtful reasons that is rejected by the author of the *Padārthadharmasaṃgraha*. It is the latter paragraph which deserves our interest in the present context.

In this section Praśastapāda discusses the case of conflicting logical reasons, traditionally associated with the technical term *viruddhāvyabhicārin*. It is not difficult to see that his treatment exhibits the following four characteristics: 1. A separate category of fallacious reasons in order to account for cases of this kind is not acknowledged. 2. Praśastapāda rejects a classification under the label of 'doubtful' (*saṃdigdha*) reasons, but advocates a subsumption under the category of *anadhyavasita* for the conjunction of two conflicting logical reasons like possession of movement (*kriyāvattva*) and intangibility (*asparśavattva*) if the possession of shape regarding the internal organ, the *manas*, is at stake. 3. The author of the text suggests that the two conflicting reasons fulfill the conditions of acceptability, in particular the *trairūpya*-conditions, if they are taken in isolation. 4. It is claimed that no decision could be attained on the basis of two such conflicting reasons or by reasonings employing them if they both had equal force. As a matter of fact, however, the two logical reasons which are cited in the example are not equal because one of them – i.e. the reason 'intangibility' adduced for proving the incorporeal nature of the *manas* – aims at establishing a proposition which is contradicted by 'tradition' (*āgama*). Therefore in one case we have to do with a thesis contradicted by what is traditionally accepted, so that – as we can presume – the other argument which establishes the corporeal nature of the internal organ on account of its possession of movement prevails.

III

It seems possible to bring Praśastapāda's statements into accord if we assume that his views entail a distinction not only between a) the correctness of the presentation of a proof and b) the correctness of a logical reason, but also between these two items and c) the correctness of a proof or an argument. As regards the correctness of the logical reason involved in the pertinent example of proving or inferring the corporeal and incorporeal nature of the *manas* on account of the possession of movement and intangibility there are two possibilities: One supposes that the relevant proving property is represented

by the conjunction of the properties involved. This means that the *hetu* would consist in the complex property of exhibiting both possession of movement and intangibility. As there is no instance apart from the subject of inference itself which exemplifies this property because – at least if we accept the tenets of Vaiśeṣika-dogmatics – the *manas* is the only entity exhibiting possession of movement together with intangibility, the consequence results that this *hetu*-property must be "uncommon", *asādhāraṇa*, and since logical reasons which violate exclusively the second *trairūpya*-condition belong, according to Praśastapāda, to the category of "undetermined", *anadhyavasita*, reasons, the non-acknowledgment of a separate variety of fallacious reasons in order to account for these cases appears justified under this aspect. If, on the other hand, one considers the two logical reasons separately, they have to be classified as correct in so far as they fulfill the requirements stipulated in the *trairūpya*-canon. But on the background of the differentiation between correctness of logical reasons and correctness of proofs or arguments this fact does not necessitate the consequence that arguments employing such reasons are acceptable. In the case of proofs with antinomic reasons one can distinguish two possibilities: 1) All arguments involved possess equal force and 2) One of the arguments prevails over the other(s). It is obviously Praśastapāda's thesis that in the first case a decision (*nirṇaya*) does not result because of the contradictory character of the reasons involved, i.e. because both reasons are *qua* logical reasons correctly employed in order to prove contradictory propositions. The second alternative, that one argument prevails over the other, is the one which, according to the author of the *Padārthadharmasaṃgraha*, holds good in the cited example. The reason lies in the circumstance that, if the argument that the internal organ is incorporeal because it is intangible is brought forward in a context where the tenets of the Vaiśeṣika-doctrine are acknowledged, it aims at establishing a proposition which violates the requirements which have been laid down by Praśastapāda previously in the text and which, among other things, entail that an acceptable thesis must not contradict the own scriptures and the own doctrine (*svaśāstra*). In this way, the author of the *Padārthadharmasaṃgraha* appears to account for all relevant possibilities: First he accounts for the logical reasons in so far as they together constitute one complex "conjunctive" reason. Second he takes into consideration the single arguments with their separate logical reasons on condition that they possess equal force and, regarding the relevant example, on the assumption that they are not brought forward under Vaiśeṣika-presuppositions. Third he takes into account the case in which the separate arguments do not possess equal force and gives his verdict on the example in so far as it occurs in a context in which the

authoritativeness of the *Vaiśeṣikasūtras* is presupposed. The fact that the fulfillment of the *trairūpya*-conditions constitute only necessary, but not both necessary and sufficient conditions of the acceptability of proofs and arguments enables Praśastapāda to avoid the consequence of the correctness of antinomical arguments under all possible circumstances.

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Praśastapāda's differentiation between antinomical arguments possessing equal force and counterbalancing each other and antinomical arguments of unequal force where one of them prevails over the other(s) is noteworthy not only because this distinguishes the account of the author of the *Padārtha-dharmasaṃgraha* from treatments of antinomic reasonings which are to be found in other texts of the same period like Śaṅkarasvāmin's *Nyāyapraveśa*, where such a distinction is missing. The difference is also important on the background of a theory of default reasoning, i.e. reasoning which is based on the exploitation of default rules or which can be described as if it relied on the employment of default rules. The term 'default rule' is meant here to refer to rules of derivation which exhibit the characteristic that their application possibly yields false conclusions in instances which can be described as "exceptional", "atypical" or "abnormal" (but not otherwise). Moreover, derivations licensed by such rules exemplify the property of "non-monotonicity", which means that derivations which are acceptable under a set of premises or a certain amount of information could become inacceptable under a larger set (a superset) of premises or if the amount of information were augmented. This is a feature which is excluded from the concept of derivability in Classical Logic.

There is a significant relationship between ancient Indian theories of inference and proof and Default Logic as well as other varieties of so called "Non-Monotonic Logics"[2] with regard to the subject-matter with which the

2 The first delailed exposition of Default Logic is to be found in R. Reiter 1980. Since we cannot discuss at this place the characteristics of (different versions of) Default Logic and Non-Monotonic Logics in detail it should suffice to say that Default Logic can be viewed as a derivational system which contains in addition to the "classical" derivation-rules "default rules" in the sense described above whose general form will be given below. Non-monotonic Logics are systems accounting for derivations which exhibit the feature of non-monotonicity explicated in the preceding paragraph. – I intend to deal with the relationship between ancient Indian theories of inference in general and systems of Non-Monotonic Logics in a separate article (*Ancient Indian Logic as a Theory of Non-Monotonic Reasoning*) which is in preparation and will furnish more detailed descriptions.

theories are concerned: Both deal with defeasible commonsense reasoning, even if not exclusively at least to such a degree that commensense inferences play a crucial role. However, in our context the connections between Praśastapāda's theoretical account of inference and proof and Default Logic are relevant. The *trairūpya*-doctrine expounded in the *Padārthadharma-saṃgraha* embodies in its strongest version, i.e. its interpretation which imposes maximal acceptability-restrictions, the following requirements: 1) The *hetu* must be known to occur in the subject of inference, 2) it must be known that the *hetu* occurs in some instance apart from the subject of inference together with the property to be proven, 3) it must be known that the *hetu* never occurs in any instance different from the subject of inference which does not exhibit the property to be proven and that there are instances of the non-occurrence of both reason and property to be proven.[3] The acceptability requirement for proofs amounts to the postulate that 1. the *trairūpya*-conditions are fulfilled, 2. the thesis to be established is not contradicted by any of a number of invalidating factors mentioned in the section on fallacious assertions/theses, in particular by means of knowledge, 3. the argument is not counterbalanced by another one employing an antinomic reason, 4. the examples are presented correctly and all the five members constituting a canonical proof are present. The fourth item can be detached as a "performance condition" from the other ones, which we could call "competence conditions", on account of the fact that the possibility of its fulfillment is in principle guaranteed by the satisfaction of the first three requirements. As regards the competence conditions, they could be explicated in such a way that they amount to the following general acceptability requirement.

AP: A proof to the effect that some x is S is acceptable if and only if a) it is known of x that it is H and b) the falsity of the proposition to be proven is neither established by one of the factors mentioned in the section on contradicted assertions nor the outcome of a proof which is acceptable if it is taken in isolation, provided that c) H is known as being invariably concomitant with S in the realm outside the subject of inference (= the *pakṣa*).

Here '(is) H' and '(is) S' refer to predicates corresponding to the *hetu* and the property to be proven, the *sādhya*, respectively and the phrase 'known as

3 For a detailed discussion on the interpretation of Praśastapāda's *trairūpya*-conditions and the *trairūpya*-doctrine in general cf. my *Studies on the Doctrine of Trairūpya* 1994 as well as C. Nenninger 1992.

being invariably concomitant in the realm outside the subject of inference' represents an abridgement of the content of the *trairūpya*-conditions two and three on the basis of the above mentioned interpretation. Now, an obvious affinity between this acceptability requirement and reasoning by default rules emerges as soon as we transform the construction 'is acceptable if and only if' into a corresponding derivation rule and treat the 'provided that'-clause as a specification of a necessary condition of the admissibility of such a rule. In this way we obtain the following inference-rule:

IR: If, for a specific x, H(x) is known and not-S(x) cannot be established either by one of the factors mentioned in the section on contradicted assertions or by a proof which would be acceptable if it were taken in isolation, then derive S(x).

The content of the 'provided-that' clause would be converted into the postulate that any inference-rule of this form should only be admitted if the property corresponding to 'H(x)' is known as being invariably concomitant with the property corresponding to 'S(x)' in the realm outside the subject of inference.[4] It is important to note that the appearance of artificiality which is created by the fact that the conditions two and three of the *trairūpya*-doctrine are assigned a special function in this way and thus separated from the first condition do not constitute a decisive counterargument against this analysis. The first condition has to be assigned a special role in any case because it represents nothing but the truth or the knowledge of the truth of the proposition which is implicitly represented in the formulation of the logical reason. Moreover, it is not only possible to establish a correlation between the first *trairūpya*-condition and the second member, the *hetu* or *apadeśa*, in the so-called "five-membered" syllogism, which is advocated by Praśastapāda. There exists also an undeniable correspondence between the third member,

4   Alternatively, the necessary requirement could be taken as consisting in the prerequisite that the property corresponding to 'H(x)' is, *as a matter of fact*, invariably concomitant with the property corresponding to 'S(x)' in the realm outside the subject of inference. This would not alter the result that the 'provided-that' clause would amount to an admissibility requirement of default-rules if its content were changed correspondingly. Therefore the essential structure of the relationship between Praśastapāda's acceptability criterion of proofs and Default Logic would not be affected if one assumed a non-epistemic interpretation of the second and the third *trairūpya*-conditions instead of the epistemic one which refers to epistemic requirements concerning the person who undertakes a proof or the adressee(s) of the utterance of the proof and which has been hypostatized above.

the *dṛṣṭānta* or *nidarśana*, and the *trairūpya*-conditions two and three in so far as the latter ones represent prerequisites which make the correct presentation of this member possible. Now, as regards the traditional doctrine of the five membered syllogism, there is a very plausible interpretation according to which this doctrine embodies a two-staged argumentation-scheme in which the member corresponding to the *hetu* represents a first-order argument for the truth of the assertion whereas the following two members, *dṛṣṭānta/udāharaṇa* and *upanaya*, represent second-order arguments for the correctness of the first-order argument.[5] But if this is so, it would on account of the relationship between the *trairūpya*-conditions and certain members of the five-membered syllogism by no means be arbitrary to relegate the conditions two and three to a meta-level with respect to the level corresponding to the first *trairūpya*-condition.

In order to make the relationship between the above formulated inference-rule and a default-rule completely plain we must only delete the 'either-or'-clause. This appears justified because its content can be regarded as representing merely a specification of possible ways in which the negation of the proposition to be proven can be taken as being established. Thus we obtain the following inference-schema:

IS: If, for a specific x, H(x) is known and not-S(x) cannot be established, then derive S(x).

All other ingredients of the theory of inference and proof which are to be found in the exposition of the *Padārthadharmasaṃgraha* can be interpreted either as postulates regarding the correct presentation, as specifications of possible ways in which the negation of the conclusion could be established or as requirements for the acceptability of instances of this scheme. Therefore the claim is justified that *IS* constitutes an essential ingredient of Praśastapāda's

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5 According to this view the *dṛṣṭānta* would fulfill the function of establishing that the adduced logical reason is suited to prove the asserted proposition on the hypostatization that the instance in question is not abnormal in a certain respect, whereas the *upanaya* – corresponding to *anusandhāna* in Praśastapāda's terminology – serves to express *that* the instance in question is not abnormal in the relevant respect and that an inference rule applying under the hypostatization of normality would be applicable in the present case. This in its turn can be taken to entail that no contradicting support for the negation of the asserted proposition exists either in form of an "antinomical" counter-argument or in the form of other kind of evidence for this fact.

theory of inference and proof.[6] At this place it only remains to point out that the general form of defaults in Default Logic is:

$$A(x): B_1(x), \ldots, B_n(x) / C(x)$$

and that its intended meaning can be expressed as follows: "If, for a specific x, $A(x)$ can be shown and $-B_1(x), \ldots, -B_n(x)$, i.e. the negations of $B_1(x), \ldots, B_n(x)$, cannot be shown, then derive $C(x)$".[7] Accordingly the derivation-rule which can be distilled from the acceptability requirements for proofs in the *Padārthadharmasaṃgraha* exhibits an intimate affinity to instances of the general default-scheme which result if '$C(x)$' is substituted for '$B_1(x), \ldots, B_n(x)$', i.e. default rules of the form: '$A(x): C(x) / C(x)$' ("If $A(x)$ can be shown and the negation of $C(x)$ cannot be shown, then derive $C(x)$").[8]

V

Against the background of this relationship between Praśastapāda's theory of inference and proof and Default Logic the question poses itself as to how the differentiation between antinomical arguments exhibiting equal force and antinomical argument-pairs in which one member is superseded by the other could be reflected in the framework of Default Logic. In this context the fact must be considered that the author of the *Padārthadharmasaṃgraha* recognizes only two means of valid knowledge, perception (*pratyakṣa*) and inference (*anumāna*). This entails that in so far as means of knowledge are concerned only these varieties can constitute a basis for invalidating members of antinomical argument pairs and making prevail members over others.

Under these premises there are at least four possibilities of integrating the above mentioned differentiation into the framework of Default Logic. First it

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6   We assume in this context that the relevant features which can be gathered from Praśastapāda's exposition of proof (or *parārthānumāna*) should also be hypostatized for the theory of "private" inference (or *svārthānumāna*) despite the fact that a number of theoretical notions like that of fallacious assertions etc. are only explicitly mentioned in the section dealing with proofs. Our following remarks concerning the relationship of Praśastapāda's logical doctrine to Default Logic are, however, not essentially dependent on this assumption and could be taken as applying exclusively to his theory of proof if one has qualms about the generalization from (public) proofs to inference in general.

7   Cf. G. Brewka 1991: 31; R. Reiter 1987: 71.

8   A complete identification of the content of *IS* or at least an ingredient of its content with that of the formulation '$H(x): S(x)/S(x)$' would therefore only require the assumption that 'is known' and 'can be shown' as well as 'cannot be established' and 'cannot be shown' are equivalent or that the expressions 'is known', 'cannot be established' can be taken as implying 'can be shown' and 'cannot be shown' respectively.

must be pointed out, however, that in the realm of Non-Monotonic Logics two attitudes are distinguished concerning the consequences which have to be drawn in view of conflicting defaults. According to the first approach all consequences which are licensed by default rules constitute acceptable beliefs; this corresponds to a, as it is called, "brave" or "credulous" behaviour of a reasoner. According to the second approach consequences licensed by conflicting defaults are not acceptable as beliefs; this corresponds to an "agnostic" or "skeptical" reasoner. Technically speaking, only such consequences constitute acceptable beliefs or "dogmas" which are contained in all "extensions".

Now, the first solution to accomodate Praśastapāda's difference between antinomical pairs exhibiting equal force and not permitting a decision and antinomical pairs with prevailing members would be to hypostatize for the proof theory of the *Padārthadharmasaṃgraha* a "cumulative (semi-)skeptical view". This means that, in the same manner as on the skeptical view concerning conflicting defaults, antinomical reasonings would in principle annul each other, but if one of the assertions concerned is contradicted by additional grounds, in particular either by perception or by other independent (default-)inferences, the not contradicted one(s) prevail(s). In other words, if there is prevalence at all that argument prevails which is least cumulatively contradicted on independent grounds.

The second solution lies in hypostatizing what one could call a "qualitative (semi-)skeptical view". This would mean that the different contradicting support is qualitatively weighted. For example evidence on perception could be given more weight than evidence grounded on inference; if perception can not be adduced, decisions could be based on qualitative differences between different varieties of inference. Both above mentioned solutions are beset with difficulties: The cumulative view would demand a more elaborate notion of independence of evidence because it neither appears reasonable nor would it probably harmonize with Praśastapāda's outlook if it were for example assumed that two arguments differing merely in the employment of synonymous expressions for the *probans* and the *probandum* constitute cumulative support. But the text of the *Padārthadharmasaṃgraha* offers us no key as to how the notion of independence of evidence should be explicated. The second view poses the problem that Praśastapāda gives us no general guiding line for the evaluation of weight. The most we can derive from his remarks in the quoted section is that "tradition" can sometimes invalidate argumentative reasonings. Moreover, Praśastapāda's list of possibilities of contradicting assertions, which would have to play a crucial role for the assessment of prevalence on qualitative grounds, is extremely puz-

zling. Besides contradictions by perception and inference, contradiction by common acceptance, by the own scriptures or doctrine and by one's own words are mentioned, but it remains mysterious, how the latter items should be related to the first two. On the background of Praśastapāda's doctrine of perception and inference as the only means of valid cognition one might be tempted to suppose that common acceptance, own doctrine and own words should be regarded as subvarieties of inference; nevertheless, the fact that the text does not tell us anything regarding this relationship together with the fact that it is by no means obvious how these latter items could be subsumed under inference as it is explained in the *Padārthadharmasamgraha* still pose problems. It seems that at this place difficulties are involved which escaped Praśastapāda's attention.

Be that as it may, there is still another and perhaps even more interesting possibility to account for the difference between the cases of neutralizing and superseding antinomical arguments. According to this solution Praśastapāda's views entail a rudimentary "dynamics" of default-reasoning. In order to understand what this means it is necessary to consider the fact that a default theory in the framework of Default Logic is defined as a pair consisting of a set of default(-rule)s D and a set of classical formulae W which describe "what is known about the world". This background offers us a distinction between a) a conflict between different defaults of a default theory arising if contradictory propositions are derivable on the basis of different default-rules and b) a conflict between a default and the set of "world-descriptions" W arising if a default rule becomes inapplicable because the proviso-condition within a default – i.e. the condition corresponding to the constituent '$B_1(x), \ldots, B_n(x)$' within the general default-schema – is not fulfilled on account of the set of world-descriptions – i.e. if negations of '$B_1(x), \ldots, B_n(x)$' are entailed by W. Since Default Logic imposes no restrictions on the way in which sets of world-descriptions might have been generated it leaves room for the possibility that some members of W might represent propositions which have been previously derived by default-inferences. This in its turn opens the way for a dynamics of default reasoning which accounts for the process of generating new sets of "world descriptions" from other sets by the application of default reasonings. This could be generalized to a more comprehensive dynamics which takes also into account the generation of world-descriptions from world-descriptions by all kinds of cognitive interactions with the world like perception etc. Now, it is possible that Praśastapāda's distinction is based on such a dynamic view. His position regarding antinomical arguments would correspond to the skeptical approach in Default Logic, in contradistinction to the previously mentioned alternatives which could be

characterized as "semi-skeptical". But in his theory default reasonings are regarded as constitutive for the creation of default theories, in particular for the generation of (new) sets of world-descriptions. Since the author of the *Padārthadharmasaṃgraha* claims that antinomical arguments with equal force never produce decisions, this situation corresponds to the situation of applying conflicting defaults generating multiple extensions under the hypostatization of a skeptical approach in Default Logic. On the other hand, the case in which an argument prevails over the other would correspond to a situation in which one of the defaults is inapplicable on account of the circumstance that it belongs to a default theory (of the form: 'A(x): C(x) / C(x)') whose W-set entails the negation of the proposition to be derived. The crucial element which blocks the derivation might itself be the result of a previous application of a default rule in the frame of *another* default theory which is co-constitutive for the generation of the W-set, but this is not necessarily so: any means of generating valid knowledge, like perception, can in principle play this role. This has to be assumed in order to account for the fact that Praśastapāda's list of contradicted assertions comprises both contradictions by inference and contradictions by perception.

In this way the theory of the *Padārthadharmasaṃgraha* would transgress the narrower frame of Default Logic, in so far as it is merely concerned with the question of deriving formulae or propositions within some *given* default theory. The transgression would consist in the fact that a certain distinction embodied in this treatise implicitly refers to the generation of default theories, in particular to the generation of their W-components. But this should not be regarded as surprising because it appears in any case impossible to integrate all theoretical elements of Indian *anumāna*-theory into this narrower frame. Some of its elements, in particular those concerned with the existence of examples, can be plausibly interpreted as referring both to the justification and to the genesis of default-rules. On this background the (implicit) reference to the generation of W-sets in Praśastapāda's doctrine would merely complement the aspect of the justification and genesis of D-sets (i.e. sets of defaults) of a default theory, which can be regarded as being implicit in Indian theories of inference.

This solution is attractive also because of the fact that it can easily account for the existence of assertions contradicted by inference (*anumāna*) as a separate category, which has its parallel in the notion of faulty theses (*pakṣābhāsa*) contradicted by inference (*anumānaviruddha*) in other texts like the *Nyāyapraveśa*. One might wonder, what should be the use of this category and the basis of its distinction from an antinomical argument, because if a thesis or assertion is contradicted by inference the situation

ensues that one proof or inference could be counterbalanced by another. To be sure, there is the theoretical possibility to distinguish the situation of antinomical arguments as a special case on account of the fact that *all* constituent arguments involved are valid if taken in isolation, a feature which is not necessarily included in the concept of a thesis contradicted by inference (because the reason or the whole argument associated with the contradicted thesis might be invalid even if it were considered in isolation). Besides a distinction could be drawn on the basis of the difference between uttering (at a particular time) two arguments which contradict each other and uttering (at a particular time) one argument which is counterbalanced by another argument uttered by somebody else or not uttered at all, but possible given the presuppositions made in the context of the argumentation. Nevertheless, there remains not only the difficulty that the pertinent textual sources do not contain any clues supporting such differentiations but it is also difficult to discern sufficient relevance in such distinctions in order to give a plausible motivation for the way in which they are accounted for in a number of *anumāna*-theories. On the background of the above sketched "dynamical" perspective, however, at least the obstacle of a lack of sufficient motivation appears surmountable. It seems intuitively plausible to differentiate between 1) a situation in which a corpus of accepted beliefs licenses the application of two or more default rules which yield incompatible results and 2) a situation in which the application of a default rule that is otherwise applicable is blocked in a particular case because the corpus of accepted beliefs entails the falsity of the proposition to be derived. Therefore it appears perfectly possible that Praśastapāda as well as his predecessors and contemporaries had a similar vision concerning *anumāna*-inferences and proofs. In this case the particularity of Praśastapāda's treatment of antinomical reasonings exhibited by the distinction between two possible situations in the context of conflicting evidence would merely represent an extended application of a principle shared also by other authors to the case in which *a plurality of inference-rules* yielding incompatible consequences is operative *within* one and the same default theory or inference system.

Despite all this, serious difficulties remain. In particular, it is highly problematic under which circumstances incompatibility with accepted beliefs deserves to block inferences. It appears, for example, utterly implausible to stipulate that default-inferences made at an earlier time and resulting in a belief which has been actually accepted should be automatically given prevailing force over any default-inferences carried out after the acceptance of the belief and yielding results which are incompatible with the accepted belief. This would entail that the proof of the incorporeal nature of the

internal organ on account of its intangibility should block all later inferences if it had by chance been applied first and its result been accepted. It must be regarded as doubtful that even Praśastapāda would be inclined to accept such a consequence. Moreover, it seems that cumulative and qualitative considerations also deserve to be given due weight in this context. Otherwise, it would become difficult to account for the rationality of retracting accepted beliefs in view of the amount and quality of counter-evidence. But this does not diminish the relevance of the distinction between inferences whose results contradict accepted beliefs, tenets, theorems etc. and inferences which are merely counterbalanced by others whose outcomes have not (yet) been accepted as established. For the mere fact that retractions of accepted propositions normally necessitate further changes in existing systems of beliefs, theories or dogmas suffices to bestow relevance on the consideration as to whether or not the acceptance of the outcome of a defeasible inference or proof would generate incompabilities with accepted propositions.

There is a fourth variety of accounting for the distinction between the different kinds in which inferences can be blocked by other inferences which is related to the above discussed solution. It is suggested by the circumstance that the verdict Praśastapāda gives regarding his example is subject to the presuppositions of the Vaiśeṣika-doctrine. The wording of the relevant passage of the *Padārthadharmasaṃgraha* does unfortunately not make plain whether the author of the text intends to say that the decision in favour of the corporeal nature of the internal organ can be maintained absolutely or specially in "Vaiśeṣika-contexts". For he could be taken as either saying that *because* the thesis of the incorporeal nature of the *manas* contradicts the "tradition" the argument for its corporality possesses greater strength or as asserting that the latter proof prevails *if* (and only if) both antinomical arguments are brought forward in the context of a Vaiśeṣika-treatise or whenever the authoritativeness of certain Vaiśeṣika-texts is taken for granted. The decisive point is that the latter possibility suggests a solution which is similar to the preceding one in that it parallels a treatment of conflicting defaults involving the consideration of several default theories but distinguishes itself by the peculiarity that default theories could be nested in others and create protective contexts. Such a view does not appear unnatural if we presume that the special tenets of Vaiśeṣika are not regarded as forming a part of the commonly accepted knowledge of the world but were rather conceived in the manner of an integrated subtheory within a more comprehensive system. There is an at least intuitive plausibility in this idea because it apparently takes into account our ability to reason under theoretical or doctrinal premises irrespective of whether or not we commit ourselves to

their truth. But it seems also possible to detect a meaning in treating subtheories of this kind in such a way that they sometimes create protective contexts: There are occasions in which we want to find out features of a theory like its consistency or the consequences it entails either by itself or on the background of commonly accepted assumptions etc. This is far from being a merely theoretical possibility because the philosophical works of the Indian tradition present not few examples for explorations of that kind. Here certain theoretical elements might be taken for granted in certain contexts and treated as if they were exempt from revisability in order to find out how other elements should be adjusted if the former ones would remain fixed.

The Indian theory of inference at Praśastapāda's time did, however, not merely provide material for the existence of tenets of particular doctrines which could be treated in this way but presented even a basis for regional inference-rules by admitting arguments which were valid only under the acknowledgement of specific assumptions. An example can be found in the section on the *viruddhāvyabhicārin*-fallacy in the *Nyāyapraveśa* where the proof: 'The sound is eternal because of its audibility like sound-ness' is mentioned as one member of a pair of antinomical arguments. The correctness of this argument taken by itself depends on the Vaiśeṣika assumption that a universal 'sound-ness' exists which is audible. In this way the ingredients were present for the idea of "doctrinal" subtheories consisting of sets of (assumed) propositions representing potential knowledge about the world as well as sets of specific inference rules which can be hypostatized as valid only under certain presuppositions or in special contexts. But this suffices in order to define a notion of a protective environment of propositions in the following manner: Proposition P of the (default) theory T = (D,W) is protected in the context C with respect to (default) theory T' = (D',W') if and only if P is element of W and any proposition P* incompatible with P such that P* is either element of W' or derivable on the basis of W' by inference rules belonging to D'[9] is treated in C as if it did not exhibit those properties (of being element of W' or derivable on the basis of W' by inference rules belonging to D')[10]. On this basis the idea of a maximal protection of a proposition P can be introduced by defining a proposition P of T to be

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9 Or more technically: .... such that P* is an element of an extension of T' (as defined in Default Logic)

10 Or: is treated in C as if it did not belong to an extension of T'. It should be noted that we did *not* say that P* is treated as if it were not derivable or as if it were not element of *any* extension.

maximally protected in context C if and only if P of T is protected in the context C with respect to all (default) theories.[11]

In order to see more concretely, how this might work in practice, let us suppose that T is a default theory corresponding to Vaiśeṣika-views. The W-component of T contains the proposition that the *manas* is corporeal = P and to D belong two default rules which license the derivation of the possession of something's being incorporeal from its being intangible and the derivation of the possession of a corporeal nature from the possession of motion. Let us further make the (slightly irrealistic) assumption that T' is a commonsense-theory differing from T only in that it does not contain the proposition P (that the *manas* is corporeal) in its W'-component. The situation might arise that one wants to inquire which consequences follow from the Vaiśeṣika-views in consideration or on the background of commonsense-views. Now, if we relate this to the framework of Default Logic it is possible to explicate the notion of following in view, in consideration or on the background of something – or at least one possible understanding of this idea – in a precise manner: We can assume that the question as to what follows from T = (D,W) on the background of T' = (D',W') should be translated into the question as to what follows from a default theory T* = (D*,W*), where D* represents the (set-)union of D and D' and W* represents the (set-)unnion of W and all propositions derivable in T'.[12] If the above described "Vaiśeṣika" and

11 Related notions could be introduced that might also be of interest for certain purposes. One can define the idea of a protective environment for elements of extensions of default theories by stipulating that a proposition P in the default theory T = (D,W) is protected in context C with respect to (default) theory T' = (D',W') if and only if P is element of an extension of T and any proposition P* incompatible with P such that.... is treated in C as if it did not exhibit those properties (of being element of W' or derivable on the basis of W' by inference rules belonging to D') – the definiens is identical with that given above for the protection of propositions which are elements of the W-set of default theories except that 'P is element of W' has to be substituted by 'P is element of an extension of T'. An analogous definition of maximal protection can easily be construed. There would also be room for the notion of an "external protection" for elements of extensions of default theories according to which a proposition P in T is externally protected in context C if and only if P in T is protected in the context C with respect to all default theories which are not identical with T. Moreover, notions of protection for (sets of) theorems of default theories could be explicated along similar lines. In our present context it would, however, lead much too far to pursue the possible ramifications which might be found out.

12 i.e. all propositions which are elements of extensions of T'. Alternatively, one could form the union of W with all "acceptable beliefs" or "theorems" of T' constituted (in accordance with the skeptical view) by the intersection of all extensions of T'. We can, however, neglect these complications in the present context.

"commonsense" theories were at stake the corresponding constitution of T*
from T and T' would obviously generate a theory embodying a contradiction
because the W* component would have to contain both the proposition P and
its negation.[13] Under these premises it is evident which function the notion of
protection could fulfill: It could block the construction of such a theory if it
were stipulated that in the pertinent context of investigating the conse-
quences of T on the background or in view of T' the proposition P is
protected with respect to T'. To treat the proposition that the *manas* is
incorporeal as if it were not derivable in T' or as if it were not element of an
extension of T' would mean in this connection that the pertinent proposition
would be eliminated in the process of constructing T*. The same would hold
good for all other propositions which are incompatible with the theorem of
the corporeal nature of the *manas*.[14]

Analogously (applications of) inference-rules could be protected by stipu-
lating that an inference-rule I of the (default) theory T = (D,W) is protected in
the context C with respect to (default) theory T' = (D',W') if and only if I is
element of D and any proposition derivable by elements of D' and incompat-
ible with a proposition that can be derived by I alone or in conjunction with
other rules which are elements of D is treated in C as if it did not possess the
mentioned derivability-property (i.e. its derivability by elements of D' is left

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13   Of course, this holds only good under the assumption that W* should represent the union
of all elements of W and the elements of *all* extensions of T' and not under the alternative
assumption mentioned in the previous footnote (that only the intersection of all exten-
sions of T' comes into play). If we wanted to generate an analogous situation under the
alternative supposition we would need alternative assumptions regarding the nature of
T', e.g. the assumption that T' differs from T in that W' of T' contains the negation of P
instead of P.

14   It might be instructive to compare this with the situation where, the other way round, the
investigation of consequences of the "commonsense-theory" on the background of the
"Vaiśeṣika-theory" is at stake. Since the proposition P, that the *manas* is corporeal,
belongs to the W-set of T its negation does not belong to any extension of T. The new
theory T* resulting from the formation of the union of all default rules of T and T' as
well as the union of all elements of extensions of T and elements of W' could only
contain the proposition P but not its negation as element of its W*-component (since our
initial supposition was that T' differs from T only in that it does not contain P as element
of W', not that it contains the negation of P) or as an element of its extensions (i.e. the
proposition that the *manas* is incorporeal is not derivable in T*). The result is in this case
the same as if the consequences of the Vaiśeṣika-theory (T) were investigated on the
background of the commonsense-theory (T') and P were protected with respect to T'.
Nevertheless, we should keep apart the idea of a protection of propositions in a context C
from the idea that theories containing certain propositions in their W-component consti-
tute the "background" or the "presuppositional context" in certain situations.

out of consideration). As in the case of the protection of propositions it is possible to introduce the notion of a maximal protection of inference-rules (and related concepts) on this basis. Moreover, one can differentiate between "internal" applications of inference rules of a theory (D,W) where only elements of D and W are concerned and "external" applications with respect to a theory (D',W') where elements of D, W and W' are involved.

Such distinctions could form the beginning of a more elaborate explication of the idea of reasoning under (doctrinal) presumptions. The crucial point is that the hypostatizations which can come into play do not merely pertain to (assumed) propositions but also to inference rules. That rules of inferring or deriving are bound to presuppositions might seem quite implausible as long as one merely thinks of classical derivation rules like *modus ponendo ponens* etc., but this is entirely different as soon as "non-monotonic" inference rules like rules applying under the hypostatization of (certain kinds of) normality are taken into consideration. It seems significant that "Indian Logic" offers a basis for the construction of "regional" and "doctrine-bound" derivation-rules.

It is equally remarkable that Praśastapāda's text contains no indication that its author was aware of the different ways of reading his remarks. There is further no reason to suppose that the writer of the *Padārthadharmasaṃgraha* suspected the existence of different aspects which the problems dealt with in the above quoted passage might exhibit and which we considered on the background of the relationship between his doctrine of inference and proof and certain recent developments in the field of theories of defeasible reasoning. Moreover, by discerning the above discussed facets the questions as to their integration presents itself. Obviously accumulation of evidence, evaluation of their quality, consideration of accepted tenets, probing the consequences of assumptions by hypostatizing propositions as well as inference-rules are ingredients of cognitive activities both in everyday life and in academic contexts, but it is much less clear how they hang together. Nevertheless, all these considerations only highlight the intricacy and complexity of the problems which are connected with the phenomenon of antinomic reasons in Indian theory of inference as well as Praśastapāda's account of antinomical arguments in the *Padārthadharmasaṃgraha*. The circumstance that we are enabled to detect such a large amount of new problems by referring "Indian Logic" to theories of defeasible reasoning and what is called "Non-Monotonic Logics" might be taken as giving (additional) support for the fruitfullness of this approach.

It is true that Praśastapāda as well as the later Indian tradition, as far as we know, did not take up all the questions which can be seen as involved in

the above cited textual passage and this is probably largely due to the fact that the defeasible aspects of inference were more and more relegated to the background in the course of the history of "Indian Logic" – not least thanks to the influence of Dharmakīrti's philosophy. But if these questions are interesting and important, we should view their neglect on the part of Praśastapāda and his tradition not only as explainable but also as deplorable.

VI

The supposition that the author of the *Padārthadharmasaṃgraha* adopted a position analogous to the skeptical view in Non-Monotonic Logics makes intelligible the claim that antinomical arguments do not produce a decision. It is, however, more difficult to find plausible Praśastapāda's assertion that they do not generate doubt. After all, the existence of conflicting evidence appears to constitute one of the most important factors for the creation of doubt in the normal sense of that word. It might be appropriate to put this tenet down to Vaiśeṣika-dogmatics and Praśastapāda's commitment to the Vaiśeṣika-doctrine which he regarded as involving the theorem that doubt must be generated by knowledge of the exemplification of a general property together with knowledge of the fact that the general property in question is sometimes instantiated together with different incompatible properties without knowing which of the incompatible properties is instantiated in the relevant case. Nevertheless, Praśastapāda's rejection of the doubtful nature of antinomic reasons possesses yet another aspect.

The classification of fallacious logical reasons in the *Padārthadharma-saṃgraha* correlates exactly with violations of the *trairūpya*-conditions. The *asiddha*-type is related to a violation of the first condition, the *viruddha* to a violation of the second and third condition[15], the *saṃdigdha*, to a violation of

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15 Or rather to violations either of the second and the third or of all three conditions, *if* the reading *yo hy anumeye 'vidyamāno 'pi* at the beginning of the section on the *viruddha* is accepted and interpreted in the sense that a *viruddha*-type is instantiated even if the reason does not occur in the subject of inference, i.e. not only if the second and the third conditions alone, but also if in addition to them the first condition is not fullfilled.

One should not forget, however, that *'vidyamāno 'pi* could well represent a corruption of *vidyamāno 'pi* – the corruption might have been triggered by the occurrence of the *avagraha* before *(a)pi*. The sense of the phrase *yo hy anumeye vidyamāno 'pi tatsamānajātīye sarvasmin nāsti tadviparīte cāsti sa viparītasādhanād viruddhaḥ* would be: "[The *asiddha* is indeed fourfold, as claimed and expounded above;] for the [logical reason] which, though it occurs in the *anumeya* (= *pakṣa*), does not occur in any [instance

the third condition alone and the *anadhyavasita* to a violation of the second condition exclusively.[16] In view of this fact one might wonder why the author takes so much trouble to refute the thesis that antinomical reasonings generate doubt. For, as far as the classification of logical reasons is concerned, this point is irrelevant on the background of Praśastapāda's classification. Either we orientate ourselves to complex properties like possessing motion and being intangible. In this case, antinomical reasons would have to be subsumed under the category of "uncommon" reasons, which the author of the *Padārthadharmasaṃgraha* calls *anadhyavasita*. Or we take as a basis the individual reasons involved. In this case we would deal with correct reasons, since Praśastapāda explicitly states that the single reasons concerned fulfill all *trairūpya*-conditions.

which is] homogeneous [but not identical] to that (the *pakṣa*) and occurs [on the other hand] in its opposite (= in the realm of dissimilar instances) is a contradictory (*viruddha*) [fallacious reason]". (The scope of *hi* is not restricted to this phrase alone but should rather be regarded as comprising the whole following section dealing with the remaining types of fallacious reasons. Its import is probably to suggest the thought that the first variety of fallacious reasons = *asiddha* is adequately dealt with in the preceding section because all remaining cases are to be subsumed under the categories discussed in the following paragraphs. Thus there is no need to assume that the text should be further amended at this place – and in particular that *hy* should be deleted).

16 We can only speculate about Praśastapāda's verdict regarding the theoretically possible cases of combined violations of the first and the second and the first and the third conditions – at least as long as we accept the relevant readings in the edition of Kavirāj/ Śāstri 1983 (and other editions). It appears probable, however, that they should be subsumed under the *asiddha*-category. This supposition harmonizes best with the circumstance that Praśastapāda's text (at least in its present form) contains phrases which refer to the occurrence of the logical reason in the *anumeya* = the *pakṣa* within the definitions of the *saṃdigdha* and the *anadhyavasita*, and possibly also of the *viruddha* (cf. the preceding footnote).

In spite of this, the question can not be regarded as settled with absolute certainty, even if one rules out the possibility considered in Nenninger 1992: 100f that the expression *acākṣuṣatvapratyakṣatvavat* might be a corrupt reading of *cākṣuṣatvāpratyakṣatvavat* and that the author of the *Padārthadharmasaṃgraha* intended to express the view that the conjunction of the possession of motion and intangibility of the mind is an undetermined reason in the same manner as (logically) impossible property-combinations like visibility *cum* perceptibility (which are exemplified nowhere). The remaining uncertainty is due to the fact that we cannot be sure whether or not Praśastapāda would generally disallow the subsumption of (fallacious) logical reasons under more than one category. Therefore the possibility remains open that the definitions of *viruddha* etc. are meant to refer specifically to the "uncontaminated" cases, i.e. logical reasons which exclusively belong to the categories in question.

We can, however, understand Praśastapāda's concern about the alleged doubtful character of antinomic reasons if we assume that he was acquainted with alternative classifications. In the *Nyāyapraveśa*, for example, we find a threefold division of fallacious logical reasons. The first category, called *asiddha*, corresponds to Praśastapāda's type of the same name and is related to a violation of the first *trairūpya*-condition. The second category, *anaikāntika*, comprises all reasons which violate either the third or the second condition alone. The third type, *viruddha*, refers mainly to reasons violating the second and the third conditions together. This classification is "impure" in the sense that some varieties belonging to the second and the third category do not correspond to violations of *trairūpya*-conditions. This holds good in particular for the *anaikāntika*-type in so far as it comprises the *viruddhāvyabhicārin*-variety because here both antinomic reasons involved fulfill the *trairūpya*-marks if taken in isolation. Now, a possible justification, which is perhaps identical with the actual rationale that historically generated this conception, might lie in the circumstance that all varieties of the *anaikāntika*-type generate doubt. After all, the *Nyāyapraveśa* asserts explicitly regarding *asādhāraṇa*- and *viruddhāvyabhicārin*-reasons that they produce this effect. Therefore Praśastapāda's anxiety to refute the doubt-generating character of the *viruddhāvyabhicārin*- as well as the *asādhāraṇa*- = *anadhyavasita*-type becomes explicable on the background of the assumption that he was not only concerned with the subsumption of various fallacious reasons under the hypostatization of his own classification but that he also intended to defend his own classificational system against rival alternatives. In particular, it might have been the aim of the author of the *Padārthadharmasaṃgraha* to justify his "pure" classificatory system which is strictly orientated by violations of *trairūpya*-conditions against the rival system represented in texts like the *Nyāyapraveśa* which brings into play the consideration of effects created by logical reasons, specifically the effect of creating doubt.

If this is true, it would not only throw some light on the level of reflection exhibited by the *anumāna*-section of the *Padārthadharmasaṃgraha* and its author, but might also be of certain interest with regard to the debated question as to Praśastapāda's life time as well as the date of the writing of his main work (since it involves that certain remarks occurring in the text are motivated by the author's wish to oppose underlying theoretical views which can be found in other works like the *Nyāyapraveśa*).

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