

METALOGICAL INCOMPATIBILITIES IN THE FORMAL
 DESCRIPTION OF BUDDHIST LOGIC (NYĀYA)

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1 *Introduction and Background Sketch* In this paper* I wish to consider two specific aspects of comparative logic. First, I wish to briefly sketch and comment upon the general post-war (rather Procrustean) methodological background regarding the Sanskrit ablative case (AC) in Buddhist logical texts and the use of the functor of material implication (MI, " \supset ") to describe the AC. Secondly, I wish to demonstrate the incompatibility of MI and AC by contextually examining truth-functionality, and the incompatible concepts of Stephan Toulmin's full-warrant and the Buddhist proto-metalogical rule of the Three Forms of the Justification (trairūpyahetu). The technical literature of philosophy of logic is saturated with warnings against assuming the interchangeability of "if p then q ," " q because of p " and " $p \supset q$." I do not wish to re-trace that ground again; rather I wish to suggest a new instance of incompatibility between " \supset " and "because" (AC) based solely on the metalogical incompatibilities found in the works of Toulmin and the (supposed) author of the sixth century, the Indian Buddhist logician, Dignāga.

I have read somewhere that when the early Jesuit missionaries first arrived in China and began the study of the Chinese language in which to propagate the Christian Dharma (teachings), they began writing grammars of Chinese utilizing the non-isomorphic descriptive categories and terminology of Latin grammar. I would not wish blatantly to assert that such questionable methodological activities have been carried out in all logical studies of Buddhist Nyāya. However, I do wish to suggest that one can construct a weak analogy between such activities and the expectations and methodological projections of (first) scholars primarily trained in western 19th century syllogistic and 20th century mathematical logic, and (second)

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their subsequent attempts to describe and elucidate Buddhist logic (Nyāya) by utilizing the logical machinery of a tradition foreign to that of Buddhist Nyāya (Chinese: yin ming). The methodological presuppositions common to the over-formalized *expectations* of the modern logician may lead him to protect the distinctions of his discipline when he looks at the primitive nature of (here) sixth century nyāya texts. The result may be a reading into a logically less sophisticated text of an over-formal analysis, which presupposes the legitimate assumptions and distinctions shared in a more sophisticated and complex modern logical tradition. I am *not* arguing that such methodological projection is not possible and sometimes helpful; I *am* arguing that in this specific context it is not accurate.

I do not wish to suggest that I have not found such comparative inquiries both interesting and rewarding. Such cross disciplinary and cross cultural studies are, in the long run, one of the most fruitful methods by which we can attain, intellectually and culturally, what we almost seem now to have economically, namely, one multivalent world. The modern tradition in philosophy of logic, a truly international enterprise today, is the only source from which methods may be generated for a truly distortion-free analysis of comparative logic.¹ It should not be construed from the foregoing remarks that I am assuming an anti-modern methodological-logical position; simply stated, I am against metalogical obscuration and implicit cultural projection.

Let me briefly try to place my viewpoint in the context of the history of logic. As is well known, the western logical tradition has undergone great and convulsive changes since Frege and has changed very rapidly since the end of the 19th century. The primary emphasis is that such development, fruitful as it is, between mathematicians, logicians, and philosophers, gives a particular emphasis and direction to the development of western logic, namely, that mathematics is held to be the primary *model* for the development of logic.² I make the assumption that the analogies between Indian logic, jurisprudence and debate are much greater than those between Indian logic, mathematics and much of formalistic logic. I suggest that we may more profitably explore the metalogical function of certain proto-metalogical machinery in Sanskrit by analyzing *both* the presuppositions of the ancient proto-metalogical traditions of India and the presuppositions of the formal machinery of modern (international) formal logic. Hence, I do not necessarily assume that the latter is a *completely* distortion-free instrument by means of which one may describe the former (Indian nyāya).

Here I wish to explore in one example, two instances of such

1. For an excellent example of such a study, see R. S. Y. Chi, *Buddhist Formal Logic*, Royal Asiatic Society of Great Britain and Ireland, London (1969), p. xxxvii. Also see my review article in *Philosophy East and West*, vol. XXIII (1973), pp. 525-535, for additional comments on this type of enterprise.

2. That it need not be *necessarily* so, one needs only to contrast the two "logics" of Aristotle of the *Topics* and the *Prior Analytics*, with that of the Stoics.

methodological emphases incompatible within the proto-metalogical context of early Buddhist Nyāya (6th-8th century). MI has been widely used to express formally the relationship between the Nyāya “conclusion” or “thesis” (pakṣa, pratijñā) and the other members (justification, hetu, and the exemplification, dṛṣṭānta) of the inference schema (parārthānumāna). I conclude that in the context of this early text the use of material implication is incompatible with both 1) the proto-metalogical theories and non-truth functional relationships found within the early Sanskrit (and Chinese) Buddhist texts and 2) with certain modern metalogical theories in philosophy of logic.

The general point in question here is the extent to which mathematical logic with its necessary and legitimate restrictions of the multiple semantic values of natural language terms does generate sufficiently and legitimately accurate expressions which describe both what is required for formal argumentation and what is presupposed semantically and ontologically in the multiple historical uses of terms in natural languages.³

The use of mathematical logic in the description and analysis of Indian Nyāya texts has become commonplace since the Second World War.⁴ I shall examine an instance of this methodological value which presupposes that the formal expressions of mathematical logic are, to a greater degree, a more desirable *model* for analysis and are a more accurate and distortion-free method of *description* than are the Indian proto-metalogical non-formal “ordinary Sanskrit” (!) technical concepts.⁵ Therefore, I shall examine in

3. I shall address these larger questions elsewhere. Here I merely wish to document two examples of such incompatibility.

4. Representative examples of post-war scholarship are:

- Daniel H. H. Ingalls, *Materials for the Study of Navya-Nyāya Logic*, Harvard Oriental Series, vol. 40, Harvard University Press, Cambridge (1951);
- Hajime Nakamura, “Buddhist logic expounded by means of symbolic logic,” in *Indogaku Bukkyōgaku Kenkyū*, vol. 7 (1958), pp. 375-395;
- J. F. Staal, “Means of formalization of Indian and Western thought,” in *Logic, Methodology and Philosophy of Science*, Proceedings of the XIIth International Congress of Philosophy, Venice (1958), et al.;
- H. Kitagawa, “A note on the methodology in the study of Indian logic,” *Indogaku Bukkyōgaku Kenkyū*, vol. 8 (1960), pp. 380-390;
- S. S. Barlingay, *A Modern Introduction to Indian Logic*, National Publishing House, Delhi (1965);
- A. Charlene S. McDermott, *An Eleventh-Century Buddhist Logic of “Exists”*, Foundations of Language, Supplementary Series, Vol. 11, D. Reidel, Dordrecht, Holland (1970);
- B. K. Matilal, *The Navya-Nyāya Doctrine of Negation*, Harvard Oriental Series, Vol. 46, Harvard University Press, Cambridge (1968), and particularly *Epistemology, Logic and Grammar in Indian Philosophical Analysis*, Janua Linguarum, Series Minor, 111, Mouton, The Hague (1971).

5. Western logicians may look to their own tradition for similar controversies, e.g., Quine, Ryle, and Strawson.

one example the degree to which there are possible obscurations and distortions generated by the methodological assumptions noted above. These are, of course, to be weighed against the real clarity, precision, and formal rigor which constitutes the *mahālakṣaṇas* (admirable characteristics) of the legitimately proud international tradition of modern mathematical logic.

2 *The Sanskrit Context* Representative Example (from the *Nyāyapraveśa*, "Introduction to Logic")⁶

Thesis: "SOUND (IS) IMPERMANENT
(pakṣa) sabdaḥ anityaṁ

Justification: BECAUSE (IT POSSESSES THE PROPERTY OF)
(hetu) CREATEDNESS.
kṛtakatvāt

Exemplification: WHATEVER (IS A) CREATED (THING), THAT (IS)
(drṣṭānta) WELL KNOWN (AS AN) IMPERMANENT (THING)
yat kṛtakaṁ tad anityaṁ drṣṭam.

Similar Example: . . . AS (IN THE) CASE OF A POT ETC.,
(sapakṣa) yathā ghaṭa adis

Dissimilar Example: . . . AS NOT (IN THE) CASE OF SPACE
(vipakṣa) yathā ākāśam

An early method of "legitimization" (not "validation") in early Buddhist Nyāya (circa. 450-600 A.D.) is "The 3 Forms of the (Relations of the) Justification-Member (trairūpyahetu)," a proto-metalogical rule. The justification-property must be: A) concomitantly present with the thesis-property (pakṣadharmatvam), B) present in the similar example (sapakṣe sattvam), and C) absent in the dissimilar example (vipakṣe cāsattvam). One possible formal translation follows below:

					Implicit
	Drṣṭānta-Warrant	Hetu-Data	Conclusion	Assumption	
(x), (iy)	((Sx Ix)	(Sy)	\supset	(Iy)	(y ∈ x)

6. Sanskrit editions of the *Nyāyapraveśa* may be found in: A. B. Dhruva, *The Nyāyapraveśa*, Part I, Gaekwad's Oriental Series, Baroda (1930); H. Ui, *Bukkyō Ronrigaku* (Buddhist Logic), Tokyō (1944); N. D. Mironov, "Nyāyapraveśa, I, Sanskrit Text, edited and reconstructed," in *T'oung Pao*, Leiden (1931), pp. 1-24; M. Tachikawa, "A sixth-century manual of Indian logic," in *Journal of Indian Philosophy* (Toronto), vol. I (1971), pp. 111-145. See my forthcoming comments on the text in the same journal. A Chinese translation of this text may be found in the *Taishō Shinshū Daizōkyō*, Buddhist Tripitaka, vol. 32, No. 1320, pp. 11-13. The Tibetan translation has been edited by V. Bhattacharya in *The Nyāyapraveśa*, Part II, Gaekwad's Oriental Series, Baroda (1927) and in the *Tibetan Tripitaka*, Peking edition, Reprint, edited by D. T. Suzuki, Tokyo (1962), No. 5706, 130, pp. 74-76.

Where:

- Properties: $S =_{Df}$ Kṛtakatva (createdness)
 (Arguments) $I =_{Df}$ anityam (impermanence) the postulated property
 (dharma) of the thesis
- Variables: $x =_{Df}$ the class of all conditioned things
 $iy =_{Df}$ restricted variable (matrix) denoted by the term
 “śabda,” the locus of property-to-be demonstrated
 (sādhyā)
- Functors: $\cdot =_{Df}$ (conjunction, “and”)
 $\supset =_{Df}$ the Sanskrit Ablative case interpreted as interchange-
 able with “if . . . then”
 $\epsilon =_{Df}$ Class Inclusion, as in $(y \epsilon x)$: y is a member of the
 class of x .

The similarity (but not isomorphism) of this formal translation to the Indian inference schema suggests many controversial metalogical issues for discussion. I shall confine myself here to that of the metalogical presuppositions of “ \supset ” (MI) and the nyāya metalogical rule of the three forms of the justification (hetu).

3 The Ablative Case as a Proto-Functor One of the most important and obvious ambiguities is the relationship of the thesis-member (pakṣa, pratijñā) and the remaining members of the inference schema, the justification (hetu) and the exemplification (dṛṣṭānta). The explicit linguistic marker that relates them is that of the ablative case (“because”); it then is obviously as important as the more familiar terms “therefore” (ergo). In the most minimal fashion the ablative case connects the thesis (pakṣa-pratijñā) member with (at least) the justification (hetu) member. The question of whether the ablative also connects the exemplification member (dṛṣṭānta) and the dissimilar (vipakṣa) and similar (sapakṣa) examples remains to be seen. As is well known the ablative case expresses a relation of removal, origin, separation, or distinction. In later Sanskrit, one of its common technical uses is that of signifying a procedure issuing from a starting point, or being caused by some situation.

We may ask the following questions: Can the ablative relation be paraphrased and thereby be reduced to one of the “standard” functors such as “and, or, if . . . then?” Or, on the other hand, must we assume that the ablative relation constitutes a unique functor and assign to it a new place in the metalanguage? Let us first note the context of the AC. The word “hetu” (justification) has at least two different functional meanings and has been much equivocated upon: 1) hetu¹ as the justification, as the second member of the inference schema, i.e., the whole ascription “because (it possesses) the property of createdness.” Here it is at the same logical level as the thesis (pakṣa) and perhaps the exemplification (dṛṣṭānta), and 2) the hetu² as a metalogical term denoting the property (dharma) concomitant with the pakṣa-dharma (thesis-property), i.e., “createdness” (kṛtakatva) and “impermanence” (anityam).

There are two linguistic components of the *hetu*¹: 1) the word, e.g., “createdness” (*kṛtakatva*), which refers to the property concomitant with the *pakṣa*-*dharmin* (thesis-property) and 2) the singular ablative case ending “-āt.” If the AC is taken in its common meaning of “because of” or “by reason of,” then what is its function in terms of the interrelations with the other meta-logical components of the inference schema? Two possible alternative translations are offered: 1) the thesis (*pakṣa*) has (or is the locus of) the property of the property-to-be-inferred (*sādhya*); *and* the property of the justification (*hetu*); 2) the *pakṣa* is the locus of the property of the *sādhya* *because of* the *hetu*’s property. The second expression is usually taken to be the more accurate translation; the reasons why it is so taken will provide the basis for the distinction between different metalogical aspects of the ablative.

A *purva-pakṣa* (*prima facie*) view would indicate that the AC might be most easily expressed by the conjunctive functor “and”; this indeed does express one aspect of the ablative—but only the first aspect. Thus, this relation of conjunction—the first aspect of the ablative *hetu*—belongs to the second-order meta-language level because it juxtaposes the ascription of the known property “createdness” (*kṛtakatva*) with the thesis ascription (*pakṣa*, *anīyam*) which denotes the locus of the property-to-be-inferred (*sādhya*) and the property (*dharma*) “impermanence” (*anīya*).

However, there is a second aspect, a second metalogical role of the ablative case. This second use of the ablative holds that the thesis (*pakṣa*) is such, i.e., the term “sound” is “impermanence-possessing,” *because* it is “createdness-possessing.” In other words, the “causative” meaning of the ablative states that the thesis (*pakṣa*) is acceptable by reason of or by appeal to the justification (*hetu*). Furthermore, it is just because of the juxtaposition of the *hetu* and *pakṣa*, plus the “causal” meaning of the second aspect of the ablative, that one is able to make the very inference stated in the *pakṣa* of the inference schema. It is the second role of the ablative which functions analogously (and *only* analogously) to a rule in an axiomatic system (or the “therefore” in the 19th century so-called “classical syllogistic”) which authorizes one, given the necessary conditions, to make an inference. It is most important to note that this is an action which is guided by a prescriptive assumption, not a descriptive one. That is, without this second aspect of the ablative the mere juxtaposition of the *pakṣa* and the *hetu* would simply be just a conjunction—a mere juxtaposition—and would not enable one to make the anticipated inference.

What then is the function of the ablative “because?” As an operator, it would seem that the function of the ablative case is to connext the justification (*hetu*) and the exemplification (*drṣṭānta*, *sapakṣa*, and *vipakṣa*) is some metalogical relationship to that of the thesis (*pakṣa*). Secondly, it indicates that the conclusion is a legitimate one by reason of the information contained in the justification and the exemplification. Indeed, it seems that the function of the ablative “-āt” is somewhat (and only somewhat) analogous to the *ordinary English* language use of “therefore, so” and “hence.” The use of the ablative case indicates that implicit or explicit in

the prior but proximate utterances of the thesis statement, that justification statements (hetu and *dr̥ṣṭānta*) supporting the thesis (in the utterer's eyes) have been offered to claim that the thesis statement should be accepted as legitimate.

Additionally, if this series of statements were then rearranged (transformed) according to: 1) the formation rules of (say) even the pre-Fregean, non-axiomatized 19th century syllogistic—with the implicit assumption that “because” is the reverse of “if . . . then,” or if: 2) it were rearranged by the juxtaposition of conjoined premises, then the AC would be viewed as joining 1) the justifying reason in the hetu,² 2) the rule-like authorization in the *dr̥ṣṭānta*, and 3) the exemplification of the concomitant dharmas of the *sādhya* and *sādhana* (hetu) as exemplified in the *sapakṣa*. Hence, except for the reverse syntax of the *parārthānumāna*, the roles of the “therefore” and the ablative case might *possibly* be seen (metalogically) as interchangeable. Further, I would submit that the relationship between the justification and that of the exemplification is clearly one which presents no descriptive problem. As is well known, juxtaposition suggests conjunction. Therefore, it is my conclusion that the ablative relation joins both exemplification and justification in the meta-logical relationship to the thesis as described above, not just the hetu.

4 The AC and Truth-Functionality Simply stated, the relationship between the AC and “ \supset ” is not truth-functional at all. Two counter examples unacceptable in the Buddhist context will serve to make the point.

A non-Buddhist (e.g., a proponent of the Mīmāṃsā school) would hold the metaphysical presupposition that 1) *śabda* (“word/sound”) was a non-created thing (a-*kṛtaka*) and 2) that therefore the conjunction of the relationships of (*iy*), ($y \in x$) and (*Ix*) does not obtain. Therefore, the third and fourth lines of the truth-table definition (FT, FF) of MI would not obtain in the formal translation offered on page 223. Neither would be allowed as a legitimate inference in a *nyāya* schema. It can be seen that (*x*), (*iy*)/(($Sx \supset Ix$) · (*Sy*)) \supset (*Iy*) · ($y \in x$) is unacceptable where:

- p: 1) *I* = *anityam* (the property impermanence), the postulated property (dharma) of the thesis member (*pakṣa*), as *per* a rival metaphysical axiom, is not concomitant with the property-to-be-inferred (*sādhya*), i.e., (*Iy*),
 q: 2) (*Iy*) is false, and
 q: 3) ($y \in x$) is false by definition, a false concomitance (*avyāpti*),⁷ based on a rival metaphysical axiom; the Mīmāṃsā schools *sabda* is permanent (*nityam*).

In other words both p and q would be rejected when 1) the exemplification (*dr̥ṣṭānta*), ($Sx \supset Ix$) and justification (hetu) (*Sy*) are false (FT), and 2) when *both* the above *and* (*Iy*) are false (FF). This may easily be and is the case between rival Indian schools (*darśanas*) holding incompatible metaphysical presuppositions.

7. The word “*vyāpti*” (concomitance) does not occur in the *Nyāyapraveśa*; however the concept is operative there.

Therefore, the legitimacy of the complex inference schema, i.e., the “premises” (exemplification, examples and justification) and the theses (or conclusion) (pakṣa), is *not* a function of the truth or falsity of their atomic components. We should note in passing that acceptance of the hetu (justification) and the exemplification-dṛṣṭānta-warrant is, in Toulmin’s parlance, a field dependent choice. In Indian philosophy, that field dependent choice is the acceptance of the justification (hetu) by all parties to the nyāya debate; it is a prerequisite for appealing to the warrant-dṛṣṭānta. In the nyāya context this usually means the rejection or acceptance of (logically prior) metaphysical presuppositions, e.g., that śabda (“word/sound” the authority of the Vedas) is eternal (but possibly unmanifested). The Indian Mīmāṃsā school holds to the eternity of śabda; the Buddhists deny the eternity of śabda.

5 The AC and the Functor of Material Implication With the descriptive model of the first order predicate calculus in mind, many scholars have been inclined to assume a symmetrical relationship between “because” and “if . . . then.”⁸ The former is implicitly held to be the reverse of the latter, and the latter is regularly expressed by “ \supset ” in most post-war interpretations. For example, Staal,⁹ Chi,¹⁰ and Barlingay¹¹ have been quick to interpret the ablative relationship in such a manner. With the assumption of such a symmetrical relation between “ \supset ” and “because” one could conclude that the relation of material implication adequately expresses the relation between the thesis and the remaining two members, i.e., the justification and the exemplification. Does this symmetry actually obtain? Let us look again at the members which authorize the drawing of an inference—the exemplification (dṛṣṭānta, sapakṣa, and vipakṣa) and the justification (hetu).

With the advent of the universally quantified expression “whatever (is) x , (then) that (is) y ,” the dṛṣṭānta seems—in the eyes of many scholars, inclined toward a mathematical model of description—to become formal logic in one full stroke as was the case in the *Prior Analytics*. The dṛṣṭānta expression, “yat . . . tat (d),” may be expressed as $(x) (Sx \supset Ix)$. Let us assume a controversial point (to be considered in detail elsewhere), namely, that the authorization for accepting the thesis (pakṣa) as legitimate resides in the exemplification (dṛṣṭānta). It is of a different logical order than the first two members of the Indian inference schema, the pakṣa and

8. There is, of course, an extensive modern tradition of scholarship warning against this assumption, e.g. Quine’s many criticisms⁷ come to mind.

9. J. F. Staal, “Contraposition in Indian logic,” *Logic, Methodology and Philosophy of Science*, Proceedings of the 1960 International Congress, edited by E. Nagel, Stanford University Press, Stanford, Cal. (1962), p. 634.

10. R. S. Y. Chi, *Buddhist Formal Logic*, p. xxxvii.

11. S. S. Barlingay, “The significance of Dṛiṣṭānta in Indian logic,” in *Essays in Philosophy*, presented to Dr. T. M. P. Mahadevan, Ganesh, Madras (1962), p. 168 ff.

hetu (justification). In fact, the *dr̥ṣṭānta* is a metalogical rule-like authorization which supports and legitimizes the evidence of concomitance described in the justification (hetu) and claimed in the thesis (pakṣa).

To elucidate the metalogical role of the *dr̥ṣṭānta* I shall refer first to the discussion of such rules in Stephen Toulmin's book *The Uses of Argument*,¹² in particular the concept of a warrant. In Toulmin's¹³ discussion, the *dr̥ṣṭānta* would be considered a "full warrant." A full warrant is a universal proposition, a metalogical prescriptive statement or rule which authorizes in this case, the drawing of the thesis (conclusion, pakṣa) by noting the concomitance of the properties "S" and "I" as described in the expression " $(x)(Sx \supset Ix)$." However, it is most important to note that the similar and dissimilar examples (sapakṣa, vipakṣa) components of the *dr̥ṣṭānta*, are essentially the backing (B) of the warrant, i.e., the evidence given to support the concomitance expressed in the *warrant*. This is independent of whether the sapakṣa presupposes existential commitment. That is, the pot "possesses" both the properties of impermanence and the property of being a created thing regardless of whether any specific pot empirically exists.

As Toulmin has noted the symmetry of "data (D) so conclusion (C)," and "(C) because of (D)" is legitimate when the information given in the second "premise" (D) appeals to a full warrant authorizing the making of the inference.¹⁴ This symmetry does not hold when the second "premise" is not a full warrant, but rather is the *backing* of a potential warrant. The form is as follows:

Symmetry of "if . . . then" and "because": (D + W, "if . . . then" C) \equiv (C because of D + W)

An asymmetry of "if . . . then" and "because": (D + B (of W), if . . . then C) \neq (C because of D + B (of W))

WHERE: D =_{Df} Data (hetu)

W =_{Df} warrant: exemplification, *dr̥ṣṭānta* without the examples, (sapakṣa and vipakṣa)

B =_{Df} backing of warrant (sapakṣa and vipakṣa)

C =_{Df} conclusion (pakṣa)

The relation between the thesis (pakṣa), the justification (hetu) and exemplification (*dr̥ṣṭānta*) is incompatible with the formal relationship of material implication (and, *a fortiori*, strict implication too). In other words, to say that the ablative, " \supset " relation is symmetrical as between "because" and "if . . . then" is to presuppose something contrary to facts, i.e., that the *dr̥ṣṭānta* represents a *full* warrant rather than a combination

12. S. Toulmin, *The Uses of Argument*, Cambridge University Press, Cambridge (1958), p. 94 ff.

13. *Ibid.*, pp. 103-135.

14. *Ibid.*, p. 107.

of a warrant and its backing. With this mixture, the ablative relation remains asymmetrical with the “if . . . then” of MI.

Therefore, the assumption that the “because” (the ablative case) is symmetrical with “if . . . then” is false if and only if there is a *nyāya* metalogical rule which presupposes that the backing for the warrant is a *necessary condition* for a legitimate inference schema. Of course, this is exactly what the *trirūpyahetu* rule requires, (p. 224). In order that the ablative relation be symmetrical with “if . . . then” the exemplification (*dr̥ṣṭānta*) would need be a full warrant, i.e., without the mixture of backing and warrant, which is extensionally equivalent to the absence of the similar and dissimilar examples (*sapakṣa* and *vipakṣa*). Since the *Nyāyapraveśa* holds that the presence of the *sapakṣa* and the *vipakṣa* are *necessary conditions* for the legitimacy of the thesis, we do not have a *full* warrant in the *dr̥ṣṭānta*; we have a mixture of the backing and a warrant. Consequently, we do not have a symmetrical relation between the thesis (*pakṣa*), and both the justification (*hetu*) and exemplification (*dr̥ṣṭānta*). Therefore, it is illegitimate to assume that the use of “ \supset ” to describe the asymmetrical “because” (ablative) relationship is a compatible distortion-free description.

Since Ryle’s¹⁵ discussion of “because” leads us into more metalogical distinctions than is possible to discuss in this context, I shall therefore merely state in passing that the Indian inference schema (in Ryle’s terminology) is an *explanation* not an inference. The conclusion (*pakṣa*) is the whole explicit statement of what is implicit in the *hetu* and *dr̥ṣṭānta*; the whole schema (*parārthānumāna*) therefore belongs to the non-formal realm all together. That is, a paraphrase of “*q* because of *p*, and if *p* then *q*” may be transformed into the form of a proper inference but the schema is not an inference as it stands in Sanskrit (or in Chinese or Tibetan). Obviously scholars need to continue this “sorting out” of the metalogical form the metalinguistic in this very mixed bag of the inference schema.

If we are to remain faithful to the attempt to describe the metalogical relationship in the *Nyāyapraveśa* *ity-āha* (as explicitly stated in the text), and to reject any descriptions however modern or in fashion which significantly distort or obscure the important *metalogical* points in the *original* text, then I am led to the conclusion that we must remain content with the non-truth functional word “because” and re-consider the attempt to express it by material implication in the standard first order predicate calculus. Secondly, we must reconsider the orders of abstraction present in the metalogical and metaphysical presuppositions common to both the exemplification (*dr̥ṣṭānta*) and the justification (*hetu*). My tentative conclusion is that the exemplification is analogous to a law whereas the justification is analogous to a thesis in an axiomatic system.¹⁶ At any rate, they are of different metalogical orders.

15. G. Ryle, “If, So” and “Because” in *Philosophical Analysis, A Collection of Essays*, edited by Max Black, Prentice-Hall, Englewood Cliffs, N. J. (1963), p. 309 ff.

16. I shall consider this in another paper.

In 1950 Jan Łukasiewicz assumed that the first trustworthy exposition of the Aristotelian syllogistic had just appeared (his own!). Prior classical scholars had not “realized that there is a fundamental difference between the Aristotelean and the traditional syllogism.”¹⁷ Modern Naiyāyikas (and/or) scholars of comparative logic may do well to emulate Łukasiewicz, Kneale, Ackrill, etc. in the Greek context, and look closely at what *both* modern mathematical philosophical logic *and* the ancient logicians (here Nyāya) presuppose methodologically and metalogically, no longer presuming that modern logic is a completely distortion-free model for the descriptive analysis of the Nyāya tradition.

6 A General Conclusion In light of the foregoing example (and others not given here) I would suggest (and *only* suggest) that the *descriptive* utility of mathematical logic with *early* Nyāya texts has simply been overrated. With its use the modern logician sees both an over-precise order and sometimes a different order than is actually found in the early Nyāya texts; most Sinologists or Sanskritists (given *their* logical backgrounds) fail to derive much of anything. Therefore, the utility of mathematical logic must be weighed by considering the real clarity but possible obscuration for the non-Sanskritist logician, which, given the state of training in both philosophy and Indology, stands in inverse proportion to the obscuration and possible conceptual distortion seen clearly by the philologically equipped Sinologist or Indologist.¹⁸ In other words, the greater the use of the well-ordered restrictions of mathematical logic, the greater the chance of distortion and the possible obscuration of important Indian non-formal and proto-metalogical issues. Therefore, the Procrustean use of mathematical logic, then, must be viewed as an extremely useful but *alternative* descriptive method and conceptual framework which may help, in many restricted contexts, to generate cross cultural matrices within which new insights into the early nyāya tradition may occur; it should not be viewed, in my eyes, as the *sine qua non rūpa*¹⁹ from which all expository *bhāgas*²⁰ must flow.

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17. Łukasiewicz, Jan, *Aristotle's Syllogistic*, Clarendon Press, Oxford, 2nd edition, p. vii.

18. Some Anglo-American academic philosophers hold the questionable thesis that technical philosophy stops west of Honolulu and most philologists would not know an inference from an implication. Their smiling receptivity to equivocations (e.g., hetu) is notorious. Perhaps the answer lies in revamping the cultural provincialisms of the curricula of the graduate schools. Of this potentially *ad hominem* polemic I shall not now further speak.

19. Rūpa (form).

20. Bhāgas (blessings).