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CONTROVERSIAL REASONING IN INDIAN PHILOSOPHY

MAJOR TEXTS AND
ARGUMENTS ON *ARTHÂPATTI*

Edited by Malcolm Keating

BLOOMSBURY ACADEMIC
LONDON • NEW YORK • OXFORD • NEW DELHI • SYDNEY

BLOOMSBURY ACADEMIC
Bloomsbury Publishing Plc
50 Bedford Square, London, WC1B 3DP, UK
1385 Broadway, New York, NY 10018, USA

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First published in Great Britain 2020

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A catalogue record for this book is available from the British Library.

A catalog record for this book is available from the Library of Congress.

ISBN: HB: 978-1-3500-7047-9
ePDF: 978-1-3500-7048-6
eBook: 978-1-3500-7049-3

Typeset by RefineCatch Limited, Bungay, Suffolk
Printed and bound in Great Britain

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Arthâpatti: An Anglo-Indo-Analytic Attempt at Cross-Cultural Conceptual Engineering

ANAND VAIDYA

1. CROSS-CULTURAL CONCEPTUAL ENGINEERING

In a series of papers (2010, 2012, and 2015) I have articulated and defended a philosophical methodology called ACE. On this approach to philosophy one uses analytical, experimental, and cross-cultural methods in combination with one another, to provide the non-academic public with a comprehensive understanding of a phenomenon in the human condition, such as the nature of knowledge. The central thesis of the method is the following:

ACE: A combination of analytical, experimental, and cross-cultural approaches to philosophy is superior to any one of these philosophical approaches alone when the purpose of the philosophical engagement is to deliver to a reasonably informed audience a comprehensive understanding of a phenomenon.

The combinatorial claim used in ACE holds that if analytical, experimental, and cross-cultural methods are each independently good for exploring a phenomenon, then, assuming their combination causes no problems, the joint use of them yields a more robust understanding of the phenomenon than any of the methods alone. However, ACE can be used for purposes other than generating a comprehensive understanding of a pre-given phenomenon. The *constructive* use of ACE I call “cross-cultural conceptual engineering,” CCCE. My account of CCCE builds on work by David Chalmers, who has emphasized the need for philosophers to engage in conceptual engineering as a philosophical enterprise of value over the more traditional project of conceptual analysis. Moreover, philosophical methodology can move away from analysis and towards engineering.

On the picture I favor, instead of asking “what is X,” one should focus on the roles one wants X to play and see what can play that role. The roles in question

here may in principle be properties of all sorts: so, one focuses on the properties one wants X to have, and figures out what has those properties. But very frequently, they will be causal roles, normative roles, and explanatory roles.

—Chalmers, 2011: 563

For example, within the project of conceptual analysis, philosophers have asked, what is knowledge? And sought to provide an analysis of knowledge, such as through the tripartite analysis of knowledge as justified true belief. Within this program the primary task of philosophers is to debate whether an analysis of a concept is correct across all cases. By contrast, in conceptual engineering, philosophers seek to answer the question: What epistemic concept can we make or identify that fits certain roles in certain domains, given other concepts we have and the goals we want to achieve? In other words, rather than trying to find out what a given epistemic concept is either through *a priori analytic* analysis or *a posteriori experimental* analysis, we seek to engineer a concept for a certain use.

In what follows, I will be engaging in cross-cultural conceptual engineering, a variant of conceptual engineering that engages cross-cultural philosophy for the purposes of conceptual engineering. CCCE can be done in two ways. On the *uni-directional* approach, one exports concepts and debates from tradition A to B for the purposes of conceptual engineering within B. On the *bi-directional* approach, one takes concepts and debates from A and B in order to engineer a concept that can bring forward discussion across traditions, or serve a new role not yet explored by either tradition. In what follows I will use bi-directional cross-cultural conceptual engineering to lay the foundation for engineering an epistemic relation that I call “epistemic grounding.” This relation is similar to the contemporary Western analytical distinction between the *ground* and the *grounded* and the classical Indian distinction between *ādhāra* and *ādheya*. Those distinctions, however, operate in the field of metaphysics. Here, I aim to engineer grounding for the purposes of epistemology. I will apply CCCE to the classical Indian debate over whether *arthâpatti* is an epistemic means for acquiring knowledge independently from *anumāna* and the contemporary analytic debate over whether inference to the best explanation is epistemically reducible to enumerative induction. From there I will move into a first attempt at the conceptual engineering of “epistemic grounding.”

2. THE DEBATE ON ARTHÂPATTI

One of the central debates in classical Indian epistemology concerns the following question: what are the valid instruments for acquiring knowledge? Following Dunne (2004: 15–20), I will refer to these as *pramāṇa* debates. The central instruments of knowledge debated are perception (*pratyakṣa*), testimony (*śabda*), inference (*anumāna*), comparison (*upamāna*), yogic perception (*yoga-ja-pratyakṣa*), and postulation (*arthâpatti*).

Within the *pramāṇa* debates, there is a specific debate as to whether *arthâpatti* is a means of knowledge independent from that of (ia) inference alone, (jia) inference in combination with another instrument, or whether it is epistemically reducible to (ib) inference alone or (iib) inference in combination with another instrument. Many

classical Indian philosophers, such as Kumārila, Gaṅgeśa, Cidānanda, Śālikanātha, and Jayanta discuss a variety of examples of *arthâpatti*. Some examples are frequently discussed, while others are seldom mentioned. Three of the main examples are the following:

Absent Caitra

One knows Caitra is not at home and thereby postulates that Caitra is outside.

Fat Caitra

One hears the sentence “Fat Caitra does not eat during the day” and thereby postulates either the sentence “He eats at night,” or the fact that Caitra eats at night.

Fire

One perceives that fire burns and thereby postulates that fire has a capacity for burning.

One question in the classical and contemporary literature on this topic is: how should these examples be classified? For example, in the classical literature there is a classification according to the distinction between *śrutâarthâpatti*, or *arthâpatti* on the basis of what is heard, and *dr̥ṣṭâarthâpatti*, or *arthâpatti* on the basis of what is seen. According to this classification scheme, Fat Caitra involves a kind of *arthâpatti* distinct from what is found in the cases of Absent Caitra and Fire because of the difference between hearing and seeing. By contrast, in the contemporary literature, Kanaujia (1992: 166–7) claims that the examples should not be classified according to whether they are linguistic or non-linguistic (using sight for example, as opposed to sound). Rather, they should be classified by the difference between *arthâpatti* based on “linguistic unintelligibility,” *arthâpatti* based on “factual unintelligibility,” and *arthâpatti* based on “the unintelligibility of a contradiction.” For our purposes here, we will not be concerned with which taxonomy is better. Rather, the point of displaying the examples and the different systems for distinguishing them is to show that the classical and contemporary theorists are concerned with answering the question: what exactly is the phenomenon in question?

3. THE ISSUE OF INFERENCE

In this section we will focus on the following question: what is inference, such that we can debate whether *arthâpatti* is independent of it? This question can be answered through two methods.

According to the “intra-framework approach,” the question of independence is debatable only within the framework of classical Indian debates about instruments, and thus we cannot and should not engage it outside of Indian philosophy. On this view, it makes no sense to bring classical Indian philosophers and contemporary analytic philosophers into contact with each other if they don’t share a common theory of inference.

According to the “inter-framework approach,” the question of independence should be engaged across the two traditions because we can, through careful historical work, take account of background assumptions about “inference,” which lead to important insights that feed bi-directional cross-cultural conceptual engineering. For

the purposes of my project, I will be taking the inter-theoretic approach. It requires that we start with the question: Is “inference” a good translation of “*anumāna*”? Speaking to the question raised, both Siderits and Yoshimizu, in their contributions to this volume, provide critical considerations about the issue.

Siderits (this volume, p. 289) argues that the epistemic differences between *anumāna* and inference make “inference” a poor translation of “*anumāna*.” On my account his argument is the following:

1. An inference, from the perspective of contemporary logic, can be deductively valid even if the conclusion is *false*.
2. An *anumāna*, from the perspective of classical Indian *pramāṇa* debates, cannot have a false conclusion.
3. When the logical and epistemic properties of terms from different languages are sufficiently different, it is not good to translate the terms as being equivalent across all contexts. In this case they are sufficiently different.
∴
4. For the purposes of epistemology, “inference” is not a good translation of “*anumāna*.”

While Siderits’ analysis is accurate, it does not impede the inter-framework approach. Rather, it provides a point of departure for a deeper understanding of what issues are at play in the cognitive-epistemic environments in which we find discussions of inference and *anumāna*.

First, while Siderits’ argument shows that *anumāna* is not an exact translation of the technical sense of “inference” used in logic, it does not show that “*anumāna*” is beyond the semantic range of the ordinary language use of “inference.” The term “inference” is a common-sense notion. It is made technical and precise within a specific logical system by logicians. We should note that the contrast between *anumāna* and inference regarding the possibility of a false conclusion might be an advantage of the classical Indian conception, and something that ought to make us critically reflect on whether the Western logician’s conception is useful in contexts where we have epistemic concerns. Importantly, we learn something powerful by bringing these distinct notions into contact with each other.

Second, there is enough “role similarity” between the two notions at the level of mental state transitions. It is not as if classical Indian epistemologists are talking about mind wandering, and contemporary Western epistemologists are talking only about deductive validity. Rather, both traditions are talking about human reasoning and offering accounts of what the goal of it is, and what makes an instance of human reasoning good.

In contrast to Siderits’ epistemic considerations about translating “*anumāna*” as “inference,” Yoshimizu (this volume, p. 225) points out some important logical considerations concerning Kumārila’s account of the difference between *arthâpatti* and *anumāna*. These logical considerations provide insight into the difference between some classical Indian discussions of *arthâpatti* and *anumāna* in relation to how “inference” is used by Western logicians. On my account, Yoshimizu argues for the following points about Kumārila’s view of *arthâpatti* and *anumāna*:

1. Throughout the whole process of *arthâpatti*, the unit of operation is always a sentence (proposition) that has the same subject, Caitra. Unlike Dignâga's *anumāna*, which makes use of a term logic, *arthâpatti* does not resort to the universal conditional statement that all those that have a certain property (*dharma*) have another property.
2. The conclusion of an *arthâpatti* is necessarily involved in the aggregate of its preconditions and is drawn on the grounds that they would not stand to reason if the conclusion were negated, in other words, by "not being possible otherwise" / "inexplicability otherwise" (*anyathânupapatti*).

From Yoshimizu's first observation, we can generate an insightful contrast between Kumārila's account of *arthâpatti* and typical discussions of "inference" by Western logicians.

If Kumārila is correct and *arthâpatti* applies to sentences while *anumāna* applies to terms, then we might ask, from the inter-theoretic framework: does Kumārila's account of *arthâpatti* differ from *anumāna* only because of the relata of those two systems, i.e., sentences vs. terms? If they differ only in virtue of their relata, this feature will not be sufficient to distinguish them as *two different ways of knowing* from the perspective of contemporary analytic epistemological discussions of logic. For example, in analytic epistemology, propositional logic and predicate logic are not taken to be distinct ways of knowing simply because of the structure of the logic of each. The fact that they are different because one is sub-sentential (predicate logic) and the other is sentential (propositional logic) and the rules of inference in predicate and propositional logic are different is not sufficient to lay claim to the view that they are two different ways of knowing. In the case of [if P, then Q; P; therefore Q], and in the case of [for all x, Fx, then Gx; Fx; therefore Gx], one knows by inference. Differences in inferential structure do not yield to differences in the way something is known. Rather, differences in inferential structure help determine whether the inference is good. However, where two inferences are good, and differ only in their structure, one still knows only by inference.

Yoshimizu's second observation forces us to go deeper into the background conditions that are in effect across classical Indian philosophy and contemporary analytic philosophy.

To start, if Kumārila is correct and *arthâpatti* is non-ampliative because the conclusion is contained in the premises and follows by necessity, then from the inter-theoretic framework it would be inappropriate to think that knowledge acquired by *arthâpatti* is either inductive or abductive. It would appear that *arthâpatti* is deductive and *anumāna* is something else. But if the former is deductive, what could the latter be? Let's look at the classic case of *anumāna* and see how it provides a taxonomical problem for Western logic.

It is well known that the classical account of *anumāna* presented by the founding father of the Nyāya school, Gautama Akṣapāda, holds that there are five steps in a good *anumāna*:

1. Thesis: There is a fire on the hill over there (not directly perceived).
2. Reason: There is smoke on the hill over there (directly perceived).

3. Pervasion: Wherever there is smoke there is fire, like in a kitchen when one is cooking and observes fire and smoke, and unlike on a lake where one never observes either fire or smoke.
4. Application: The case of smoke and fire is like the case of what is experienced in the kitchen.
5. Conclusion: There is a fire on the hill over there (not directly perceived).

Colonialist commentators on the Fire-Syllogism often negatively criticized it as a mixture of inductive and deductive reasoning. For example, A. H. Ritter (in 1838) wrote:

One point alone appears certain, and that is, that they [the Nyāya] can lay but slight claims to accuracy of exposition. This is proved clearly enough by the form of their syllogism, which is made to consist of five instead of three parts. Two of these are manifestly superfluous, *while by the introduction of an example in the third the universality of the conclusion is vitiated.*

—Ganeri 2001: 9, *emphasis added*

Ritter's critique is that step (3) introduces an example, which draws into question the nature of the claim in (3). For example, were the premise simply (3a) "Wherever there is smoke, there is fire," the argument would look more like a deductive one, where the conclusion, "There is fire on the hill over there," is correctly derived. However, by introducing the example, it seems as if step (3) is problematic, since it now looks as if the universal claim, "Wherever there is smoke, there is fire" is supported by an instance, which is *inductively* insufficient to support the universal claim. So, what is the correct classification of *anumāna* according to the distinction between ampliative and non-ampliative reasoning found in the West? If *arthâpatti* is deductive, thus non-ampliative, because the conclusion is contained in the premises, what is *anumāna*? Let me explore three options from the inter-theoretic frame.

The *rejection* option holds that it is neither, and not even a good way of arguing because it confuses ampliative and non-ampliative reasoning. The *mixed* option holds that it falls into more than one category or that it falls into neither category. Unlike the *rejection* option, the *mixed* option tries to save *anumāna* as a viable account of reasoning within the classic distinction between ampliative and non-ampliative reasoning. In contrast to these two options, the *confrontation* option holds that the standard form of *anumāna* as presented by Gautama challenges the adequacy or completeness of the Western distinction between ampliative and non-ampliative reasoning. That is, on Yoshimizu's reading of Kumāriila, where *arthâpatti* is a form of reasoning involving sentences and *anumāna* is a form of reasoning focusing on terms, we are in a position to critically examine the Western philosophical view held by logicians, statisticians, and educators that maintains that the distinction between ampliative and non-ampliative reasoning is basic.

The alternative conception of how to carve up the space denies that the distinction between ampliative and non-ampliative is the basic distinction. Rather, the distinction between *anumāna* and *arthâpatti* is fundamental, because what one reasons upon, sentences vs. terms, is more fundamental than the kind of reasoning they engage in, ampliative vs. non-ampliative. One reason for adopting this view maintains that

good reasoning requires both deductive and inductive support. Inductive support aims to capture which generalities we are to reason from. Deductive support helps us discover what follows from the generalizations. Moreover, a piece of reasoning is good only when it has both parts. What separates kinds of reasoning is what one is reasoning with: terms vs. sentences.

Let me now articulate four issues about inference that we must turn to in order to effectively use the inter-theoretic framework. The first issue concerns the metaphysics of inference itself. Is a theory of inference a theory of a specific kind of transition between mental states for a kind of agent in an environment or is it simply a theory of an abstract relation between sets of propositions or sentences which can be used to represent and talk about the normativity of inference with respect to what counts as a good or bad inference? As I will use the term, a “separatist” on this issue holds that a theory of inference is only concerned with answering one of these questions, but not both. By contrast, a “unionist” holds that both questions are part of a theory of inference. A unionist accepts that there is a relationship between them, where a satisfactory answer to either needs to integrate with and complement the answer to the other.

The second issue derives from the first, and involves drawing a distinction between the logical representation of an inference and the mental realization of one. The logical representation of an inference is an abstract formal representation of an inference within a logical system, such as first-order classical logic. The mental realization of an inference is an actual inference made by a specific kind of cognitive agent in a reasonably well-defined type of environment, where the inference is for some purpose. In addition, whether the inference needs to be made consciously is dependent on the cognitive situation and the goal in question. For example, in the debate on expert cognition, some, such as Hubert and Stuart Dreyfus (1980), argue that an instance of expert cognition, such as in a lightning chess game, is non-conceptual and non-inferential. One core issue at play in that debate is whether inferences are (a) conceptual or non-conceptual, (b) consciously and deliberately made or non-consciously and non-deliberately made, and (c) how much duration is necessary for a mental state transition to count as inferential. Moreover, there are various parameters that we can apply to a theory of inference when considering it in a given cognitive environment, with respect to a specific domain, and in light of an agent’s skill level and goal.

The third issue concerns the location of a theory of inference within the broad categories of ontology, logic, social debate theory, philosophy of mind, and epistemology. Here one asks: To which field(s) does a theory of inference properly belong? As I use the term, a “singularist” on this issue would claim that a theory of inference belongs to one of these categories primarily and to others only derivatively, if at all. A “pluralist” would argue that a theory of inference belongs to two or more of these primarily, but not to all. Siderits’ observation that *anumāna* as a *pramāṇa* cannot lead to a false cognition trades on the fact that classical Indian philosophers see the debate over how *anumāna* works as being part of the debates over which instruments are valid instruments of knowing (i.e., *pramāṇa* debates). In modern terms one might say that classical Indian philosophy takes human reasoning to be in the service of epistemology.

The fourth issue concerns the debate over logical monism. Logical monism—which has been the default view concerning logic in Western debates for centuries—holds that there is only one true logic. Logical monists give an account of (a) why there is only one true logic, and (b) which logic is the one true logic. Logical pluralists, such as Beal and Restall (2005) and Bueno and Shalkowski (2009), hold that there is more than one true logic. Pluralists try to give an account of (c) why there is more than one true logic, and (d) which logics are contained within the set of true logics. The main logics considered by pluralists include the classic trinity of classical, intuitionistic, and paraconsistent logic. The question they engage is: How should we understand the notions of “logical consequence” and “validity” so that the trinity of logics are all a kind of logic?

All four of these points speak to the questions: (1) How should one pursue the inter-framework approach? and (2) What are the core benefits one derives from consideration of these issues? Let me now apply these points so as to answer (1) and (2).

Using logical pluralism as a background for the inter-theoretic framework, the following argument sets up an answer to (1).

The argument from logical pluralism

1. Either logical pluralism or logical monism is true.
2. If logical pluralism is true, then there is more than one correct formal system of reasoning.
3. Logical Pluralism is true.
- ∴
4. There is more than one correct formal system of reasoning.
5. The question of whether *arthâpatti* is independent of inference depends on which system of inference we are talking about. For example, it could be dependent on system L_1 while being independent of L_2 . And debates over whether it is dependent on L_1 can be engaged without consideration of the question of dependency with respect to some other L_i .
- ∴
6. Whether or not *arthâpatti* is dependent on or independent of inference rests on which system, L_i , we are talking about.

As an initial response to question (2) we can say the following. We need not debate whether the form of classical Indian *anumāna*, provided by the well-known *Fire-Syllogism* is in fact correct or superior to other forms of inference found in the West, such as Aristotle’s categorical syllogism. Second, we need not limit the historical debate as to whether *arthâpatti* is independent of *anumāna* to the framework of classical Indian philosophy, a project pursued by Das (this volume, p. 255) and Yoshimizu (this volume, p. 225). Third, we can make room for the idea that even if *arthâpatti* is dependent on one kind of formal system, that does not preclude it from being independent of another formal system. We can now apply these points to show what value they have in the context of the debate over whether *arthâpatti* is independent of *anumāna*.

Suppose that Ram hears (Utterance 1) “Caitra is alive, but not at home,” and transitions to (Thought 2) “Caitra is outside.” Yoshimizu (this volume, p. 233) shows that Ram’s thought transitions allow for a deductive proof in propositional logic of the sentence “Caitra is outside,” and a deductive proof in predicate logic of the sentence “There is some place such that Caitra is at that place, but that place is not home.”

For Proof 1, let: C = Caitra is alive, A = Caitra is at home, and B = Caitra is outside. For Proof 2, let $Ax = x$ is alive, $Lyx = y$ is located at x , $c = \text{Caitra}$, and $h = \text{home}$. Both Proof 1 and 2 are elaborated in much greater detail in Yoshimizu (this volume, p. 233). For the points I will be making, the shortened versions of the proofs will be sufficient. It is important to note that the steps in Yoshimizu’s proofs are *intended* to align with *Kumārila’s* explicit claims in his account of *arthāpatti*.

Proof 1

1. $C \rightarrow (A \vee B)$	Assumption
2. C	Assumption
3. $\neg A$	Assumption
4. $A \vee B$	1, 2 MP
5. $\neg B \rightarrow A$	4, IMP
6. $\neg \neg B$	3, 4 MT
7. B	6 DN

Proof 2

1. $Ac \rightarrow \exists x Lcx$	Assumption
2. Ac	Assumption
3. $\neg Lch$	Assumption
4. $\exists x Lcx$	1, 2 MP
5. $\forall x \neg (Lcx \wedge \neg (h=x)) \rightarrow Lch$	Assumption
6. $\neg \forall x \neg (Lcx \wedge \neg (h=x))$	3, 5, MT
7. $\exists x (Lcx \wedge \neg (h=x))$	6 $\neg \forall x \neg / \exists x$

My commentary on these proofs will use the four issues about inference I listed above. I will start with the fourth point and work backward to the first.

Since logical pluralism is assumed, we can immediately note that these proofs constitute ways in which the relevant claims can be proved. The fact that we can represent Ram’s thought transitions in first-order classical logic does not mean that the representation in that system is either correct or the only useful one. For example, we know that the argument expressed by the English compound sentence “All men are mortal, Socrates is a man; therefore Socrates is mortal” can be represented in propositional logic as $P, Q, / R$, where each letter stands for one atomic sentence in the argument. We are permitted to do this since there are no operators (such as “and”) in any of the premises. More importantly, there are no quantifier symbols in propositional logic that can be used to capture the quantificational facts of the argument given by “all” and “some.” In terms of propositional logic, the inference captured as $P, Q, / R$ is *invalid*. When we move to quantificational logic, we get a better representation. Where “a” is a name for Socrates, “F” a predicate for “x is a

man,” and “G” a predicate for “ x is mortal,” we can symbolize the argument as: $\forall x (Fx \rightarrow Gx), Fa / Ga$. In this translation we can recover the intuition that the inference is *valid*. So, even if Yoshimizu’s representations in first-order logic capture an intuition about Ram’s thought transition (i.e. that it is valid or good), it does not follow that we need to hold to the view that it is the only representation that can express the intuition that the inference is good. Importantly, we cannot prove Caitra is outside in either propositional intuitionistic logic or predicate intuitionistic logic, since disjunctive syllogism is not permitted in those systems. So, if the thought transition essentially depends on disjunctive syllogism, then intuitionistic logic cannot be a method of proof for Ram’s thought transitions. This point shows why the provability of Caitra’s location, as elegantly and rigorously provided by Yoshimizu, is important. Kumāriila could not have accepted *both* intuitionistic logic *and* thought that Ram’s thought transitions are an instance of *arthâpatti*, where it is understood as a non-ampliative inference.

Taking a step backwards, we ought to keep in mind two things: (a) the relation between logic and epistemology in classical Indian philosophy, and (b) the domain in which this inference is supposed to be operating. Concerning (a), as I noted earlier, for classical Indian philosophers human reasoning is in the service of epistemology. This view of the relation could be considered a failing of classical Indian philosophy by those that hold that logic is the pure science of logical consequence, and that the absence of a distinction between logic and epistemology reveals an “immaturity” in their development of a theory of reasoning. This account of the situation is not necessary. First, from the fact that they were primarily interested in another topic—sources of knowledge—it does not follow that they *could not* have developed a theory of the abstract patterns of reasoning and the relations between them. Second, it is perhaps a virtue, rather than a flaw, of their engagement with logic that it is articulated within the framework of their epistemology. In this way, logic is presented as a tool that aims at some end. The aim of logic is knowledge. It is not just truth and the relations that hold between abstract patterns, where the notion of a good argument derives from its *form* being such that it is *impossible* for the premises to be true and the conclusion false.

Stepping backwards again, to an even broader perspective, we need to note that there is a reasonable distinction to be made between the logical representation of an inference and the mental realization of one. As already noted, Yoshimizu could be correct in the way he has represented the logical inference, at least in the sense that he has given us a rendering of it in first-order logic. The fact that it is a plausible logical representation of the inference within a system, however, does not mean it is mentally realized in that way. For example, suppose Ram has a mental transition from a thought produced by hearing (Utterance 1) “Caitra is alive, but not in his house” to (Thought 2) “Caitra is outside.” Now Ram could have had a mental transition from (Utterance 1) via steps (1) to (6), culminating in inferring (7). However, he need not. Our question should be the following: For a subject that does not mentally realize the transition from (Utterance 1) to (Thought 2) via (1) to (6) followed by inferring (7), what is the status of their mental state transitions? Are they good? We need not decide whether it is an inference in the narrow sense of fitting into some logical system of inference. Instead, we can say that it is an

inference in the broad sense, where we are simply interested in whether one ought to believe (Thought 2) on the basis of (Utterance 1) in a way that respects the environmental conditions under which the utterance and thought were generated. We need to note that both logical representations of inferences and mental realizations (i.e., the actual mental transitions that a cognitive agent undergoes) are of equal value in epistemology. This takes us to our final, and since we are moving backwards, our first point.

What is a theory of inference a theory of? In particular, what were classical Indian philosophers thinking about when they were theorizing about *anumāna*? One thing is quite clear, and strikingly in contrast with the bulk of contemporary Western philosophy of logic: classical Indian philosophers were interested in a *causal theory of inference* because they were interested in human reasoning for the purposes of knowledge acquisition. In the case of inference, a conceivable problem that would arise from the Western philosophical point of view is that the focus on a causal theory of inference leads to the view that classical Indian philosophers were unconcerned with or unable to comprehend the idea of a normative theory of inference. What is the difference? The simple contrast comes from two distinct questions. For a causal account the central question is: How do we in fact reason? For a normative account the central question is: How ought we to reason? Those that advocate a normative account often maintain that a focus on causation misses the point of logic. We draw conclusions; that is, we make all kinds of inferences, in all sorts of ways. Given a specific cognitive end, such as the truth, some of these ways are good, and some are bad. A theory of inference should guide us to which ways of reasoning are productive relative to a given constraint, such as truth or knowledge.

Taking the unionist approach I mentioned earlier, my position is that a theory of inference should be concerned with what sorts of mental realizations cognitive agents experience and the kinds of causal processes involved, as well as how they ought to go about reasoning. We cannot really investigate how one ought to reason unless we are also concerned with how they can and cannot reason. The strong divide between causal accounts and normative accounts is a false dichotomy.

For example, suppose at t_1 someone hits me on the head with a cricket bat, and at t_2 I announce, "Given that there are clouds in the sky and the pavement is wet it is probably raining." Furthermore, it is in fact raining, and I am looking out at the sky and the pavement. A theory of inference should be able to tell us that this series of mental state transitions (assuming that the t_1 event is in the set of proximal causes of the t_2 event) is not a good one. The fact that what I announce counts as a good probabilistic argument isn't enough to tell us why the mental state at t_2 is not a good mental state given the t_1 event. We ought not to believe that it is raining when the set of proximal causes for the belief involves both a thump on the head and a good inductive argument. There is a clear sense in which we can mix *because* and *should* in this case. I should not believe that it is raining, when the cause of that belief involves a thump on the head, regardless of the inferential credentials of the pattern of reasoning that can be abstracted from my mental state transitions. A *unionist* holds that this kind of back and forth between normativity and causal pathways is necessary for a comprehensive theory of inference.

4. THE ISSUE OF REDUCTION

Given that we are exploring the question of whether *arthâpatti* is independent of *anumāna*, we need to discuss not only the nature of inference, but also what it means to say that an instrument is *independent* of other instruments. Das (this volume, p. 255) offers a useful gloss on the classical Indian conception of an independent means of knowing: “For . . . classical Indian philosophers, an epistemic instrument *M* is *independent* (*svatantra*) just in case there is no other epistemic instrument, *M**, which explains how we gain knowledge by *M*.”

Using the inter-framework approach, it will be useful to engage both the debate over “basic sources” in analytic philosophy and the “independent means debate” in classical Indian philosophy, so as to observe the differences. In Table 13, I offer an account of some of the differences.

The table shows that classical Indian philosophers debated whether *arthâpatti* is an independent means of knowledge. They were not debating whether *arthâpatti* is a basic source of knowledge. By contrast, contemporary analytic philosophers are debating whether a source is basic or derivative. However, because we are engaged in cross-cultural conceptual engineering we should ask: how can we bring these debates together to generate new ideas? One way to do so is by looking at recent work within analytic epistemology as to whether inference to the best explanation is reducible to some set of epistemic tools. This question is relevant because, at least in some cases, *arthâpatti* has been identified with a kind of inference to the best explanation. Keating (2013) offers a partial defense, Guha (2016) a critique, Yoshimizu (this volume, p. 225) a further critique.

TABLE 13: Basic Sources and Independent Means Debate

<i>Debate</i>	<i>Characterization</i>	<i>Differentiation</i>	<i>Arthâpatti</i>
Independent Epistemic Instrument Debate in Classical Indian Philosophy	<i>I</i> is an independent epistemic instrument of knowledge only if what <i>I</i> gives one access to is such that there is no other <i>I*</i> that can give one access to what <i>I</i> does.	Inference is an independent source of knowledge because even though it takes perceptual states as inputs, it yields knowledge that perception cannot yield.	Could be an independent source of knowledge because even though it can take input from other sources, it might still yield knowledge that one cannot acquire through other means.
Basic Sources of Knowledge Debate in Contemporary Analytic Philosophy	<i>S</i> is a basic source of knowledge only if <i>S</i> does not depend on any other source of knowledge <i>S*</i> for its deliverances.	Inference is not a basic source of knowledge, since inference takes perceptual input.	Cannot be a basic source of knowledge, since it positively depends on input from other sources, such as perception.

Argument for reduction of *arthâpatti* to inference and perception

1. Some cases of *arthâpatti* involve what might be called “power *arthâpatti*.” For example, in the Fire case one postulates the unobservable capacity of fire to burn, based on either a single observation of a burning fire or after repeated observations of burning fire.
2. In cases of power *arthâpatti*, we reason by way of inference to the best explanation.
3. Inference to the best explanation is reducible to enumerative induction combined with perceptual acquaintance.
∴
4. Cases of power *arthâpatti* are reducible to induction combined with perceptual acquaintance.

The crucial premise in the reduction argument above is (3), and Fumerton (2018) provides us with a defense of (3). Not only is his argument important for our investigation of power *arthâpatti*, but the epistemological overlay that he provides for inference to the best explanation (hereafter “IBE”) is instructive. The epistemological overlay allows for a contrastive understanding of the classical Indian debate about epistemic instrument reducibility in relation to the Western epistemological debate about source reducibility. What then is the epistemological overlay?

Fumerton maintains a position called “inferential internalism.” A consequence of this view is that inference to the best explanation can help solve an epistemological problem for a subject *only if* it has the following form, and the subject has justification for believing both premises.

1. O has occurred.
2. E is the best explanation of O.
∴
3. E.

With respect to the question of whether IBE is reducible to induction, Fumerton (2018: 6) is most interested in examining the question within the framework of *special powers*: “The question . . . I want to ask, is whether these forms of reasoning are *sui generis* kinds of reasoning that do not owe their epistemic power to other more fundamental kinds of reasoning.” He offers us an illustrative example:

If I know what usually causes that distinctive sound I associate with thunder, then I can certainly use the fact that I heard that sound as part of my enthymematic reasoning to reach the conclusion that lightning just struck. But if the causal hypothesis appears as a *premise*, there is no reason yet to suppose that the *reasoning* is anything other than a more mundane sort of statistical reasoning. I antecedently know that this sort of sound is *usually* produced by lightning, I can inductively infer from my awareness of the sound, and my knowledge of its usual source, that in all probability lightning occurred. This is just classic enumerative induction where the correlation described in the premises involves causes and effects.

—Fumerton 2018: 7

Importantly, he characterizes the relationship between conscious awareness and background principles in a way that bridges the gap between internalism and externalism about justification in analytic epistemology.

We may not bring to the fore of consciousness all that we rely upon in forming beliefs based on what others tell us, but the relevant beliefs are there lurking in the background, and it doesn't take much to remind ourselves that we are critically relying upon them. Furthermore, even as they hovered in the background as non-occurrent beliefs, or even merely beliefs we would form were we prompted in the right way, it is not clear that the ground of those dispositional beliefs isn't active in producing a prodigious array of output beliefs. And in so far as they are active, it seems to me that they would themselves need to be justified.

—Fumerton 2018: 7

His basic argument against IBE having special and distinct powers is the following.

1. There are two cases in which inference to the best explanation is claimed to be used: old cases and novel cases.
2. Both cases can be explained by induction without there being any special powers that attach to inference to the best explanation.
- ∴
3. IBE has no special powers for arriving at knowledge over and above that of induction alone or induction in combination with perception.

He considers two cases of IBE. The first concerns prior experience cases. Here he discusses the case of testing acidity through litmus paper. The second concerns novel experiences. Here he discusses the case of a gorilla being dissected for the first time.

The Litmus paper case: Suppose we dip litmus paper in a liquid, and it turns red. We infer that it is an acid. In that case, Fumerton argues that even if it looks like we are reasoning to the best explanation, the epistemic powers of our reasoning actually come from standard induction where a causal relation holds between litmus paper turning a certain color and a solution being acidic. He denies that there are any special rules, such as “litmus paper” rules, that we specially employ when we make the inference. Rather, the litmus paper case is simply an instance of general inductive reasoning.

The Gorilla case: Suppose we have never dissected a gorilla. Can we expect to find a heart and a kidney? Recounting the relatively late discovery of gorillas by Europeans, Fumerton argues that we can expect to find a heart and a kidney. The mere fact that gorillas have not been dissected is not sufficient to show that there is nothing from which we can reason. Gorillas are animals of a certain kind, mammals. They have externally identifiable characteristics that allow for them to be classified in this way. Consequently, we can reason via induction, as opposed to IBE.

The basic point of the argument underlying these two cases is that IBE is reducible to induction because the epistemic powers come from induction and not from anything distinctive about IBE. The novel cases are the ones he thinks are significant. His view is that although we might think that we are required to use IBE in a novel

case, since there is nothing prior to go on, we are in fact wrong. Often enough, novel cases really are subsumable under larger categories from which we can reason. In effect, there are no true novel cases that would require IBE having special powers.

For the purposes of cross-cultural conceptual engineering, we should note that there are three ways in which Fumerton's argument for the reduction of IBE *does not* align with the classical Indian investigation into whether *arthâpatti* is an independent means of knowledge.

First, Fumerton couches his argument within the framework of justification and belief that one finds in the analysis of knowledge debates following the work of Gettier (1963), where justified true belief is not sufficient for knowledge. However, Karl Potter (1984) and Purushottama Bilimoria (1985) have debated the question of whether classical Indian philosophers even think of knowledge within the paradigm of justified true belief. There are two open questions. On the one hand, if classical Indian philosophers think of knowledge as involving belief and justification, do the Sanskrit equivalents of those terms operate in exactly the same way or do they differ? On the other hand, perhaps classical Indian philosophers, do not begin their epistemic investigation with a compositional account of knowledge, where it has parts. For example, Bilimoria (1985) holds that many Indian philosophers think of knowledge as an episodic mental state as opposed to a static state that persists. In addition, *arthâpatti* is debated as an epistemic instrument independent of inference with respect to knowledge acquisition, and not mere justified belief.

Second, although Fumerton tries to resolve a tension between internalism and externalism about justification in analytic epistemology, he adopts an overarching internalist framework for presenting an account of IBE. On this conception, conscious access to reasons are essential to justification for a belief. By contrast, the dominant conception of knowledge explored in classical Indian philosophy is externalist. On this conception, conscious access to reasons is not essential to knowledge acquisition. As a consequence, there is a partial misalignment. Moreover, can Fumerton's internalist account of justification be used to make sense of *arthâpatti* as a source of knowledge?

Third, *arthâpatti* is debated in classical Indian philosophy as an epistemic instrument for gaining knowledge in a case where *no other means are possible*. However, Fumerton's argument simply shows that in the cases he has considered one can use induction instead of IBE and that the epistemic powers of IBE in those cases are due to induction. From that result, *it does not follow* that *there are no* cases where IBE delivers knowledge that is *not* accessible by other means, even if induction were used. For example, what if there really are novel cases where reasoning via other categories does not lead us to any valuable insights about the target which we are reasoning about. Should we be using induction to show that every argument is either inductive or deductive?

Moving away from cross-cultural comparative philosophy within the inter-theoretic framework approach, it is time to turn to conceptual engineering. Here I want to ask: Is there a way to make progress beyond these two debates by conceptually engineering a new concept for cross-cultural epistemology? I believe this can be done by looking to metaphysics for an alternative account of what could be at issue in epistemic instrument independence and epistemic reduction.

5. ENGINEERING EPISTEMIC GROUNDING

Jonathan Schaffer (2009) offers an account of a kind of metaphysical inquiry based on “metaphysical grounding” within neo-Aristotelian metaphysics. His view is opposed to ontological conceptions of metaphysics, where the central question is: “What exists?” By contrast, he argues:

The neo-Aristotelian will begin from a *hierarchy view of reality* ordered by priority in nature. The primary entities form the sparse structure of being, while the grounding relations generate an abundant superstructure of posterior entities. The primary is (as it were) all God would need to create the posterior is grounded in, dependent on, and derivative from it. The task of metaphysics is to limn [delineate] the structure.

—Schaffer, 2009: 351

Building on Schaffer’s work on metaphysical grounding, we can introduce a notion of “epistemological grounding” into the territory of reduction and independence. A theory of epistemic grounding should tell us (a) which instruments are more fundamental than others, and (b) why certain instruments might be more appropriate for a given domain. By moving away from the notions of reduction and independence and toward the notion of grounding, we invite a new debate on *arthâpatti*, as well as other epistemic instruments.

The following analogy between metaphysical grounding and epistemological grounding is useful for the conceptual engineering of the latter. Within debates on metaphysical grounding, the following inference patterns are discussed. Where T is a table and $P_1 \dots P_n$ are its proper parts, we get:

<i>General Claim</i>	<i>Example</i>
1. X is metaphysically grounded in Y . ∴	T is grounded in its parts $P_1 \dots P_n$.
2. Y is more fundamental than X .	$P_1 \dots P_n$ are more fundamental than T .
3. X is not real, but Y is.	T is not real, but $P_1 \dots P_n$ is.
4. X is real, but less real than Y .	T is real, but less real than $P_1 \dots P_n$.

One of the core debates is about what follows from (1). All proponents take it that (2) follows, since grounding is a relation concerning fundamentality; but they differ over whether (3) or (4) follows. Some proponents, such as Schaffer (2009) and Audi (2012), take it that (3) does not follow, but that (4) follows. Replacing, “metaphysical ground” with “epistemic ground,” and “real” with “instrument” or “less fundamental,” and holding R as a variable ranging over epistemic instruments, we get the following arrangement.

<i>General Claim</i>	<i>Example</i>
1. X is epistemically grounded in Y . ∴	IBE is epistemically grounded in R .
2. Y is more fundamental than X .	R is more fundamental than IBE .

<i>General Claim</i>	<i>Example</i>
3. <i>X</i> is not an instrument, but <i>Y</i> is.	<i>IBE</i> is not an instrument, but <i>R</i> is.
4. <i>X</i> is an instrument, but less fundamental than <i>Y</i> .	<i>IBE</i> is an instrument, but less fundamental than <i>R</i> .

Nevertheless, one might ask, what are the advantages of dropping the debate over epistemic reduction and epistemic independence and moving to a debate over epistemic grounding? There are three central advantages.

First, in terms of breathing life into an old debate by bringing it into contact with a contemporary discussion we can manufacture a new debate for philosophers of mind, cognitive scientists, and historians to engage in. Instead of simply asking whether *I* is an epistemic instrument, we can also ask whether *I* is a fundamental epistemic instrument. Although classical Indian philosophers were not in fact discussing epistemic grounding, we can take their work on epistemically independent means as a starting-point for a debate on how to think about epistemic grounding. Importantly, being historically accurate about what they were debating lays a proper foundation for helping us to determine why epistemic grounding might be a more valuable topic of discussion than epistemic independence or epistemic reduction.

Second, we can acknowledge that the rational foundations of an epistemic instrument might be laid out in one way while the cognitive processes that bring about the product of the epistemic instrument are explained in another way. For example, Fumerton could be correct that *IBE* is not *rationally* fundamental because its rational foundation is best captured by acquaintance and enumerative induction, not by any special powers that *IBE* has. However, that would not validate an inference to the claim that there *isn't* some context in which *IBE* is a more accurate description of the causal processes that bring about a justified belief in a claim. The only thing that is validated by the fact that the epistemic powers of *IBE* are present in virtue of other rational procedures, such as induction, is that *IBE* is *not* as fundamental as induction with respect to rational powers. In other words, *IBE* is less fundamental than induction because it can be adequately explained by other rational procedures. Nevertheless, we need not conclude from its being less fundamental that it is not an independent epistemic instrument in some contexts.

Third, there is an obvious constraint on actual exercises of reasoning that supports the drawing of a distinction between *context-sensitive rationality* that is less fundamental than *absolute rationality*. The constraint concerns time-sensitivity with respect to cognitive goals that require conscious decision-making. Human agents make decisions in time. And time is a constraint on rationality. We can model rationality both in terms of an infinite amount of time and a finite amount of time, or without taking time into consideration at all. Given that reasoning takes time, a decision that is rational under *n* amount of time, might be irrational under *n + m* amount of time, where either new information is introduced or the connections between pieces of information are further reviewed for error detection. Temporally bounded rationality has been a research program in economics, decision-theory, and psychology for at least fifty years. Herbert Simon, who pioneered the move away from abstract

time-independent accounts of cognitive agents with perfect rationality to time-bound real agents, said this about the research program of “bounded rationality”:

Broadly stated, the task is to replace the global rationality of economic man with the kind of rational behavior that is compatible with the access to information and the computational capacities that are actually possessed by organisms, including man, in the kinds of environments in which such organisms exist.

—Simon 1955: 99

By acknowledging time-sensitivity as a factor on rationality, we can acknowledge that the pattern of reasoning from (1) to (2) still allows for (3) to hold true.

1. X is epistemically grounded in Y .
- ∴
2. X is a less fundamental epistemic instrument than Y .
3. However, X can be used as an epistemic instrument in context C with respect to goal G , where its mental realization is independent of Y .

We can take our discussion of *arthâpatti* as an example.

1. *Arthâpatti* is epistemically grounded in *anumāna*.
- ∴
2. *Arthâpatti* is a less fundamental epistemic instrument than *anumāna*.
3. However, *arthâpatti* can be used as an epistemic instrument in context C with respect to goal G , where its mental realization is independent of *anumāna*.

In addition, many schools of Indian philosophy hold that *anumāna* depends on *pratyakṣa*. Consequently, the pattern relating *arthâpatti* to *anumāna* can usefully be compared to the pattern relating *pratyakṣa* to *anumāna*.

1. *Anumāna* is epistemically grounded in *pratyakṣa*.
- ∴
2. *Anumāna* is less fundamental than *pratyakṣa*.
3. However, *anumāna* can be used in context C with respect to goal G where its mental realization is independent of *pratyakṣa*.

What is the difference between the two cases?

In the case of *pratyakṣa* and *anumāna*, claim (1) is false. The relation that governs how *anumāna* is related to *pratyakṣa* is the relation of epistemic input to epistemic processes, which does yield a dependency relation, if the input always has to come from a given source, such as *pratyakṣa*. Reconsider the classic Fire-Syllogism.

1. Thesis: There is a fire on the hill over there (not perceived directly).
2. Reason: There is smoke on the hill over there (perceived directly).
3. Pervasion: Wherever there is smoke there is fire, like in a kitchen when one is cooking and observes fire and smoke, and unlike on a lake where one never observes either fire or smoke.
4. Application: The case of smoke and fire is like the case of what is experienced in the kitchen.
5. Conclusion: There is a fire on the hill over there (not perceived directly).

TABLE 14: Epistemic Grounding vs. Epistemic Fundamentality

<i>Case</i>	<i>Epistemic Grounding</i>	<i>Epistemic Fundamentality</i>
<i>anumāna/pratyakṣa</i>	Partial epistemic grounding, since perception merely provides an input to inference, which means that part of the epistemic powers of inference depend on the epistemic powers of perception.	Perception is epistemically more fundamental than inference, since no case of perceptual knowledge depends on inferential knowledge, but all cases of inferential knowledge partially depend on perceptual knowledge for their epistemic powers.
<i>arthâpatti / anumāna</i>	Whole epistemic grounding, since inference provides all the epistemic powers of <i>arthâpatti</i> .	Inference is epistemically more fundamental than <i>arthâpatti</i> , since no case of inference depends on <i>arthâpatti</i> , but all cases of <i>arthâpatti</i> derive their epistemic powers from inference. However, <i>arthâpatti</i> causally operates independently from inference.

At step (2), we learn that the epistemic support for the reason claim, “that there is smoke on the hill over there,” is perception. Therefore, the conclusion of the Fire-Syllogism is *partially* epistemically grounded in perception, but not *wholly* grounded in perception, since the other elements are not perceptual.

By contrast, in the *arthâpatti* and *anumāna* case, the claim is that the epistemic powers of *arthâpatti* are wholly, epistemically grounded in *anumāna*. However, the causal processes that bring about knowledge in the case of *arthâpatti* need not follow the same path as in the case of *anumāna*. Consider Table 14.

The key difference between the two cases concerns the issue of epistemic powers vs. causal pathways. *Anumāna* requires perceptual input, and thus *anumāna* depends on a perceptually acquired input *in all contexts*. Thus, the causal pathway for *anumāna* involves input provided by the causal pathway of *pratyakṣa*. However, in the case of *arthâpatti*, the epistemic powers derive from *anumāna*, but they need not share the same causal pathway. The process of *arthâpatti* takes a causal pathway different from that of *anumāna*. That is, even if the epistemic powers of *arthâpatti* are epistemically grounded in *anumāna*, it will not follow that *arthâpatti* is *not* epistemically independent of *anumāna*. For in some contexts, the causal pathways for *arthâpatti* and *anumāna* will be different.

6. A PATH FORWARD FOR ARTHÂPATTI

Bi-directional cross-cultural conceptual engineering is about building concepts for the purposes of a cross-cultural conceptual repertoire. In this effort, I have begun

the work necessary to establish *epistemic grounding* as a concept within cross-cultural epistemology. In order to move forward with this project, we should ask ourselves: What purpose does the engineering of epistemic grounding serve for philosophy?

First of all, it alleviates a tension in classical Indian and contemporary analytic debates over the questions of epistemic independence and epistemic reduction. On the one hand, classical Indo-analytic epistemologists are interested in discussing which epistemic instruments are independent of other epistemic instruments. On the other hand, contemporary Anglo-analytic epistemologists are interested in discussing what sources of knowledge are reducible to other sources of knowledge. By engaging with the topic of epistemic grounding, one can address both the issue of instrument independence and epistemic reduction. Furthermore, within the framework of epistemic grounding, one can think about degrees of fundamentality with respect to epistemic powers, but also about how instruments causally operate independently of one another. In general, the account of where the epistemic powers of an instrument rationally derive from is both entangled and separable from the causal pathways in cognition that epistemic instruments take.

Second, the engineered concept opens up room for discussion of the question: what epistemically grounds what? While in the past, we might have debated what sources of knowledge are basic and which instruments are independent of one another, we can now look at how those debates are (a) different, or (b) relevant to a new debate centering on what epistemically grounds what. This makes room for preserving what was at stake historically in the debates, while at the same time allowing for philosophical progress. Just as work on metaphysical grounding makes room for the revitalization of a metaphysical project that focuses on the hierarchy of reality, epistemological grounding transforms two culturally separate debates into a new, third debate. The first debate is exemplified by the exchange between various members of the Nyāya and the Mīmāṃsā tradition over whether *arthāpatti* is an independent instrument from that of *anumāna*. The second debate is exemplified by the question, “Is inference to the best explanation epistemically reducible to induction?”

Finally, the method of bi-directional cross-cultural conceptual engineering I have engaged in here used the classical debate in Indian philosophy over independence and the contemporary analytic debate over epistemic reduction in order to engineer the concept of epistemic grounding. The hope has been that a sufficient amount of groundwork has been laid so as to encourage two things: first, that the method of cross-cultural conceptual engineering is fruitful; and second, that the concept of epistemic grounding can be developed further. The hope here has been that epistemic grounding can serve as a point of departure for an inquiry into what grounds what at the boundary of the mind in relation to ways of knowing. In this inquiry we take seriously the idea that the causal pathways for reasoning in time while constraining rationality partially depart from the way in which we determine whether an instrument is absolutely fundamental from the perspective of temporally unbounded rationality. In a new way we marry the debates between classical Indian philosophers over instrument independence with analytic debates about epistemic reduction.

REFERENCES

- Audi, P. (2012), "A Clarification and Defense of the Notion of Grounding," in F. Correia and B. Schneider (eds.), *Grounding and Explanation*, 101–21, Cambridge: Cambridge University Press.
- Bilimoria, P. (1985), "Jñāna and Pramā: The Logic of Knowing—A Critical Appraisal," *Journal of Indian Philosophy* 13, no. 1: 73–102.
- Beal, J. C and G. Restall (2005), *Logical Pluralism*, Oxford: Oxford University Press.
- Bueno, O. and S. Shalkowski (2009), "Modalism and Logical Pluralism," *Mind* 188, no. 470: 295–321.
- Chalmers, D. (2011), "Verbal Disputes," *Philosophical Review* 120, no. 4: 515–56.
- Dreyfus, H. and S. Dreyfus (1980), "A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition," *Storming Media*, www.stormingmedia.us/15/1554/A155480.html.
- Dunne, J. (2004), *Foundations of Dharmakīrti's Philosophy*, Boston: Wisdom Publications, Inc.
- Fumerton, R. (2018), "Reasoning to the Best Explanation," in K. McCain and T. Poston (eds.), *Best Explanations: New Essays on Inference to the Best Explanation*, 65–80, Oxford: Oxford University Press.
- Ganeri, J. (2001), *Indian Logic: A Reader*, New York: Routledge.
- Guha, N. (2016), "On Arthāpatti," *Journal of Indian Philosophy* 44, no. 4: 757–76.
- Kanauji, T. D. (1992), "Heterogeneity of Arthāpatti," in H. S. Prasad (ed.), *Philosophy, Grammar, and Indology: Essays in Honor of Professor Gustav Roth*, 165–84, Delhi: Indian Books Center Publishing.
- Keating, M. (2013), "Mukulabhaṭṭa's defense of Lakṣanā: How we use words to mean something else, but not everything else," *Journal of Indian Philosophy* 41, no. 4): 439–61.
- Potter, K. (1984), "Does Indian Epistemology Concern Justified True Belief?" *Journal of Indian Philosophy* 12, no. 4: 307–27.
- Schaffer, J. (2009), "On What Grounds What," in D. Chalmers, D. Manley, and R. Wasserman (eds.), *Metametaphysics: New Essays on the Foundations of Ontology*, 347–83, Oxford: Oxford University Press.
- Siderits, M. (2003), *Personal Identity and Buddhist Philosophy: Empty Persons*, Farnham, UK: Ashgate Publishing.
- Simon, H. (1955), "A Behavioral Model of Rational Choice," *Quarterly Journal of Economics* 69, no. 1: 99–118.
- Vaidya, A. (2010), "Philosophical Methodology: The Current Debate," *Philosophical Psychology* 23, no. 3: 391–417.
- Vaidya, A. (2012), "Intuition and Inquiry," *Essays in Philosophy* 13, no. 1: 284–95.
- Vaidya, A. (2015), "Public Philosophy: Cross-Cultural and Multi-Disciplinary," *Journal of Comparative Philosophy* 6, no. 2: 35–57.