Lecture 2: Dignāga's system of logic

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0. Dignāga analyzes the second means of a valid cognition (*pramāṇa*), Inference (*anumāna*), from the two different points of view, that of epistemology and that of logic. In other words, Inference has two faces, viz., Inference for Oneself (i.e., Inference proper) and Inference for Others (i.e., proof). He defines the former as 'cognition of an object from an inferential mark (*liṅga*) possessed of three characteristics,' and the latter as 'illumination of the object that has been cognized by oneself.' For example, we infer the existence of a hidden fire on a hill from a piece of smoke arising from the hill. If some one is in doubt of the existence of the fire, we can prove it in a certain logical formulation. Namely, "There is a fire on the hill because we see a piece of smoke there; and so on."

As I stated in the first lecture, the object of inference is called 'general characteristic' (*sāmānyalakṣaṇa* 共相) that is the universal to be contrasted with the particular (*svalakṣaṇa* 自相), the object of perception. The result of inference is either 'object-awareness' or 'self-awareness' just as in the case of perception.

1. Perhaps the most important contribution of Dignāga to the development of Indian theory of Inference is his discovery of the theory of Pervasion (*vyāpti*). The essential nature of Inference/Proof in Indian logic is Analogy. For example, we observe smoke where there is a fire such as in a kitchen and we do not observe smoke where there is no fire such as in the middle of a lake. We observe a piece of smoke on a hill. Then we infer that there must be a fire on the hill like in a kitchen. In this context we are tacitly presupposing a sort of general rule that where there is a fire there is smoke.

As I mentioned in the first lecture, the theory of three characteristics (*trairūpya*) of a valid reason played an important role in the development of Indian logic. Since a reason (*hetu*) in Proof corresponds to an inferential mark (*liṅga*) in Inference, a valid inferential mark is also supposed to possess the same three characteristics. The three characteristics are as following:

(1) An inferential mark is observed in an object of inference (*anumeya* 所比/*pakṣa* 宗);
(2) It is observed in similar instances (*sajātīya/tattulya/sapakṣa* 同品); and
(3) It is not observed in the dissimilar instances (*vijātīya/asapakṣa/vipakṣa* 異品).

The last two characteristics are later called *anvaya* (positive concomitance/continued presence) and *vyatireka* (negative concomitance/continued absence) that constitute what George Cardona called 'Indian Principle of Inductive Reasoning'. He says:[1]

> Indian thinkers have used a mode of reasoning that involves the related presence (anvaya 'continued presence') and absence (vyatireka) of entities as follows:
>
> (1) a. When X occurs, Y occurs.
> b. When X is absent, Y is absent.
> (2) a. When X occurs, Y is absent.
> b. When X is absent, Y occurs.
>
> If (1 a, b) hold in all instances for X and Y, so that these are shown consistently to occur together, one is entitled to say that a particular relation obtains between the two. Either (1a) or (1b) alone will not justify this, and a claim made on the basis of either can be falsified by showing that (2a) or (2b) holds. One relation that can be established by (1) is that X is a cause of Y. A special instance of the cause-effect relation involves the use of given speech units and the understanding by a hearer of given meanings. If (1 a, b) hold, the speech unit in question is considered the cause of one's comprehending a meaning, which is attributed to that speech element.

[1] "On reasoning from Anvaya and Vyatireka in Early Advaita", *Studies in Indian Philosophy, A Memorial Volume in Honour of Pundit Sukhalji Sanghavi*, L.D. Institute of Indology, Ahmedabad, p. 79.

Let me give you some strings of uttering.

(1) *grāmaṃ gacchāmi /*	*(grāmaṃ / gacchā/mi)*
(2) *grāmaṃ gacchasi /*	*(grāmaṃ / gaccha/si)*
(3) *nagaraṃ gacchāmi*	*(nagaraṃ / gacchā/mi)*
(4) *nagaraṃ gacchasi /*	*(nagaraṃ /gaccha/si)*

English equivalent of each uttering is as follows:

(1a) I go to the village.	(I / go to / the village.)
(2a) You go to the village.	(You / go to / the village.)
(3a) I go to the city.	(I / go to / the city.)
(4a) You go to the city.	(You / go to / the city.)

If we ignore the difference between *gacchā-* and *gaccha-*, we can distinguish five elements in each of the above two sets of utterances. By applying the *anvaya-vyatireka* method we will be able to establish the exact correspondence between the two sets of five elements. For example, *grāmaṃ* occurs in (1) and (2) and 'the village' occurs in (1a) and (2a), and the former is absent from (3) and (4) and the latter is absent from (3a) and (4a). Thus we can infer that when *grāmaṃ* is uttered, the village is meant by the speaker.

As Cardona rightly points out, *anvaya-vyatireka* is the method to discover a certain relationship between two items, especially the relation of cause and effect. In the above example, the utterance of *grāmaṃ* causes the comprehension of its meaning, i.e., the village. Coming back to the example of a fire and smoke, we observe that where there is a fire, there is smoke and where there is no fire, there is no smoke. In this way we can establish a causal relationship between a fire and smoke. In my opinion the second and the third characteristics of *trairūpya* theory represents the result of inductive reasoning by means of *anvaya* and *vyatireka*.

Now Analogical inference and Inductive reasoning have the well-known problem. Namely, how many positive and negative evidences we may have, they are not as definitive and conclusive as Deductive reasoning. Indian logicians must have felt the same problem and they gradually developed the concept of *nāntarīyakatva/avinābhāva/avyabhicāra* for a

valid inferential mark/logical reason. According to Vasubandhu, for example, a valid inferential mark/reason cannot and should not exist without that which is to be inferred/proved (*anumeya/sādhya*). In other words, it is not deviant from where there is *anumeya/sā*dhya (i.e., the similar instances) and it is always absent from where there is no *anumeya/sādhya* (dissimilar instances). It is Dignāga who could reformulate the *trairūpya* theory, by introducing the restrictive particle *eva*, in order to express the inseparable and non-deviant relationship between a valid mark/reason and its object. His version of *trairūpya* is as follows:

(1) An inferential mark is observed in an object of inference (*anumeya 所比/pakṣa 宗*); (cf. 遍是宗法性)
(2) It is observed ONLY (*eva*) in similar instances (*sajātīya/tattulya/sapakṣa 同品*); (cf. 同品定有性) and
(3) It is NEVER (*naiva*) observed in the dissimilar instances (*vijātīya/asapakṣa/vipakṣa 異品*). (cf. 異品遍無性)

According to Indian Grammarians, the restrictive particle has a function of restricting (*niyama/avadhāraṇa*) an item A in the domain of another item B in the phrase "A B *eva*". For example, the sentence "*śiṃśapā vṛkṣa eva*" means that *śiṃśapā* is restricted to the domain of trees (*vṛkṣa*), in other words, it is a tree only and nothing else. Thus, according to Dignāga, a valid inferential mark/reason should be restricted to the domain of that which is to be inferred/proved. Such a relationship between the two is named by Dignāga 'pervasion' (*vyāpti*), meaning the domain of a valid mark/reason should be pervaded by that of that which is to be inferred/proved.

The theory of pervasion is the final achievement of the development of the *trairūpya* theory in India. Not only Buddhist but also Indian logicians on the whole adopted Dignāga's theory of pervasion and built their system of logic on that foundation. As we shall see soon, with the theory of pervasion Dignāga could formulate in his proof a sort of proposition with the universal quantification, such as "Wherever there is smoke, there is a fire" and "Wherever there is no fire, there is no smoke."

With the introduction of the theory of pervasion or universal quantification, Dignāga created another problem of induction. Namely,

how can we establish a universal law like "Wherever there is smoke, there a fire" by means of the *anvaya-vyatireka* method? Without the help of an omniscient being, it is impossible for us ordinary beings to check all the positive and negative cases of induction. Dignāga was well aware of this problem and he concludes that our inference is an essentially hypothetical cognition. We may assume the existence of a fire from a piece of smoke as long as we do not see (*adarśanamātreṇa*) smoke without a fire. Thus he seems to believe in the validity of inference or proof as long as there is no counter example.

2. As we have seen Dignāga considers that a single sense organ does not reveal all the aspects of an object of perception[2]; similarly, he thinks that an inferential mark does not reveal all the different natures/properties of an object of inference. An entity fire has many universal properties such as 'fireness', 'substanceness', 'being a fire of grass', and 'being a fire of a tree'. According to Dignāga, an inferential mark, smoke, can reveal that the object of inference possesses the universal property of 'being a fire' (or fireness) and other universals of higher order (such as substanceness). However, it cannot reveal that it has the universals of lower order such as 'being a fire of grass'. Regarding an inferential mark Dignāga also points out its universal properties of different orders such as substanceness, smokeness, 'being smoke of white color' and 'being smoke of black color'. According to him, smokeness and other universals of lower order can reveal its object but the universals of higher order cannot.

In this connection Dignāga for the first time hints at the idea of Apoha.[3] According to him perception reveals its object in an affirmative way (*vidhi*) but Inference reveals its object in a negative way, i.e., in the form of 'exclusion/negation of others' (*anyāpoha/anyavyavaccheda/anyavyāvṛtti*). For example, an inferential mark 'smoke', or more precisely the universal property of 'being smoke'

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[2] cf. *Pramāṇasamuccaya 1.5: dharmiṇo 'nekrūpasya nendriyāt sarvathā gatiḥ / svasaṃvedyam anirdeśyaṃ rūpam indriyagocaraḥ // = Nyāyamukha 16* 有法非一相根非一切行　唯内證離言　是色根境界

[3] 一事有多法　相非一切行　唯由簡別餘　表定能隨逐 (NMukh 17, PS 2.13)
如是能相者　亦有衆多法　唯不越所相　能表示非餘 (NMukh 18, PS 2.17)

or 'smokeness', cannot directly and affirmatively reveal its object 'a fire' but it reveals its object 'fireness' in the negative form, namely that of 'exclusion/negation of others, i.e., non-fires'. As Frauwallner pointed out a long time ago, Dignāga expressed his idea of Anyāpoha when he discussed Inference in the *Nyāyamukha*. Later he applied it to the verbal cognition and to conceptual cognition in general.

For example, concerning a certain object of inference, an inferential mark, a certain fragrance's being a quality (*guṇatva*) reveals its object as exclusion of non-substance (*adravya*) —N.B. there is no quality without substance to which it belongs—. The nature of fragrance (*gandhatva*) reveals it both as exclusion of non-sbstance as well as that of non-earthly-substance. The nature of good fragrance (*saurabhya*) in addition reveals it as exclusion of non-good fragrance. Furthermore, the nature of a specific good fragrance reveals it as exclusion of non-lotus fragrance, too. In this way, we come to realize that the object of inference is a lotus flower.

Why does Dignāga consider that an inferential mark reveals its object in negative way or in the form of exclusion/negation of others (anyāpoha)? We must recall that the object of inference for him is not the particular but the universal characteristic. Unlike the Naiyāyikas and other Indian Realists Dignāga does not admit the reality of the universals. He regards it as a mental construction in the form of exclusion/negation of others. For example, the universal characteristic of a pot or potness is exclusion of non-pots that is found in everything that we name 'pot'. As a matter of fact, Dignāga says in the *Pramāṇasamuccaya* chapter V that *anyāpoha* possesses all the natures of the universal(*sāmānya*)/genus (*jāti*), viz. (1) singularity, (2) eternity and (3) presence in every member of its class. In short, *anyāpoha* is nothing but the universal in Dignāga. The only difference is that it is a mental construction for Dignāga, while it is an external reality for Indian realists.

There was a long debate between Buddhists and Indian Realists concerning the reality of the universals. The theory of Apoha is Dignāga's answer to the question of the universals. He admits the role of universals as the object and the content of inferential cognition but he denies its external reality by characterizing it as mental construction in the form of exclusion/negation of others. As Akihiko Akamatsu once analyzed with reference to Dharmkīrti's theory of *apoha*, if we apply the scheme of

pramāṇa, prameya and *pramāṇaphala* again in this context, *prameya* of inference is the universal characteristic. *pramāṇaphala* is the cognition of the universal characteristic. And the universal characteristic is nothing but *anyāpoha* for Dignāga. Now *pramāṇa* too is exclusion of others, for inference or verbal cognition and conceptual cognition in general reveal its object by excluding/negating things other than that. In this way *anyāpoha* is involved in every aspect of inferential and verbal cognitions.

3. So far I have discussed Dignāga's theories of 'pervasion' (*vyāpti*) and 'exclusion of others' (*anyāpoha*) with reference to Inference. Now I would like to discuss his system of logic or proof. The most important contribution of Dignāga in this area is the Wheel of Reasons (*hetucakra* 因輪) that is a kind of check list to discover the valid reasons by means of the theory of *trairūpya*. Before going into that subject I would like to introduce the proof formulations of Vātsyāyana, the Naiyāyika, and Dignāga himself.

Vātsyāyana's formulation of five propositions (*pañcāvayava*) in the *Nyāyabhāṣya* ad *Nyāyasūtra 1.1.39:*

> Thesis: Word/sound is non-eternal.
> Reason: Because it is of the nature of arising.
> Exemplification: Substance such as a dish is seen to be of the nature of arising as well as non-eternal.
> Application: Similarly, word/sound is of the nature of arising.
> Conclusion: Therefore, word/sound is non-eternal because it is of the nature of arising.

Dignāga was very conscious of how we should formulate a proof and he severely criticized the formulations of the Naiyāyika, Sāṃkhya and others. It is possible to rewrite the above formulation in Dignāga's way as follows:

> Thesis: Word/sound is non-eternal.
> Reason: Because it is of the nature of arising.
> Exemplification: Whatever is of the nature of arising is non-eternal like substance such as a dish. And whatever is not non-eternal (i.e., eternal) is not of the nature of arising like the space/ether, etc.

Unlike Vātsyāyana's formulation of five propositions Dignāga's formulation consists of only the first three propositions, which means he regards the last two propositions as redundant. He considers that the subject/topic of a thesis should be something real, for otherwise the first characteristic of a valid reason (namely, the reason must belong to some subject) could not be obtained. Therefore, he did not accept the *reductio ad absurdum* (*prasaṅga*) type of reasoning as the formal proof. He also criticizes it because the subject of a thesis and that of reason often are different in such a proof.

Now the most significant difference between the above two formulations is the difference in formulation of Exemplification. In Vātsyāyana's formulation it is merely an expression of the co-existence (*anvaya*) of two properties but in Dignāga's formulation it consists of two formulae of 'pervasion' (*vyāpti*), that of positive concomitance (*anvayavyāpti*) and that of negative concomitance (*vyatirekavyāpti*). Thus Dignaga's theory of pervasion has left a clear expression in his formulation of proof. He also adds some actual examples to support his formula of pervasion, which I take shows a reminiscence of Inductive reasoning in India. He was later called *bahirvyāptivādin* who establishes 'pervasion' with reference to external objects.

Dignāga examines each proposition of his proof formulation and points out erroneous cases. He defines Thesis as that which the proponent himself wishes to prove. He distinguishes four cases of pseudo-theses.

(1) That which is denied by perception, as e.g. "Sound is not audible."
(2) That which is denied by inference, as e.g. "A pot is eternal."
(3) That which is denied by the proponent's own position, as e.g. "*pramāṇa* does not take *prameya* as its object."
(4) That which is denied by verbal convention, as e.g. "*śaśin* is not the moon."

You may think that it is not necessary to list such nonsensical theses. However, it is in fact necessary to reject those erroneous theses before actually starting the proof because some of the above these can be proved in Dignāga's system. For example,

Thesis: Sound is not audible.
Reason: Because it is a product of human efforts.
Exemplification: Whatever is a product of human efforts is not audible as e.g. a pot, etc. And whatever is audible is not a product of human efforts.

The reason 'being a product of human efforts' possesses all the three characteristics of a valid reason. Since sound is a product of human efforts, it possesses the first characteristic. Now the universe of discourse consists of the topic of the thesis 'sound', the similar instances 'non-audible things' and the dissimilar instances 'audible things'. Since sound is the only audible thing in the world, the domain of the dissimilar instances is empty. Consequently, the reason 'being a product of human efforts' is found at least in a part of the similar instances and is not found in the dissimilar instances because the latter is empty. Thus the reason under discussion possesses the second and the third characteristics, too. Therefore, according to the theory of *trairūpya* the above erroneous proof should be regarded as a valid proof, which is absurd. That is why Dignāga lists Pseudo-Theses to avoid such a problem.

Regarding the reason, he considers that that which does not

possess the first characteristic, i.e., *pakṣadharmatā* 宗法性, is not a valid reason. It is called 'Unestablished' (*asiddha* 不成). Thus the reason must be a property of the topic/subject of a thesis (*pakṣadharma*), such as sound and the hill. Now he has earlier written a small text of logic called *Hetucakraḍamaru* where he lists the nine possible cases of reasons (*pakṣadharma*), depending on whether it is present, absent or both in the similar instances and whether it is present, absent or both in the dissimilar instances. I list the nine proof formulae.

(1) "Linguistic item (*śabda*) is eternal because it is an object of cognition (*prameya*) like space and unlike a pot."
(2) "Linguistic item is not eternal because it is a product like a pot and unlike space."
(3) "Linguistic item is a product of human efforts because it is not eternal like a pot and unlike lightening and space."
(4) "Linguistic item is eternal because it is a product like space and unlike a pot."
(5) "Linguistic item is eternal because it is audible like space and unlike a pot."
(6) "Linguistic item is eternal because it is a product of human efforts like space and unlike a pot and lightening."
(7) "Linguistic item is not a product of human efforts because it is not eternal like lightening and space and unlike a pot."
(8) "Linguistic item is not eternal because it is a product of human efforts like a pot and lightening and unlike space."
(9) "Linguistic item is eternal because it is not substantial (*amūrta*) like space and an atom and unlike action and a pot."

The second and the eighth reasons possess both the second and the third characteristics and are valid reasons. The fourth and the sixth reasons does not possess either the second characteristic or the third characteristic; hence they are not valid reasons. They are pseudo-reasons called 'Incompatible' (*viruddha* 相違) because they will proof the thesis that is incompatible with the original thesis. The rest of five reasons are pseudo-reasons called 'Inconclusive' (*aniścita/anaikātnika* 不定) because they do not possess the second characteristic, though they possess the third

characteristic.

Regarding the formula of Example, Dignāga insists that we should state both positive and negative exemplifications (*sādharmya- & vaidharmya-dṛṣṭānta* 同喩・異喩). They are supposed to present the positive or negative pervasion in the proper way by using the relative pronouns and the restrictive particle *eva*. He seems to be aware of the fact that both exemplification formulae are logically equivalent, so that theoretically one is enough. Yet he insists on the necessity of formulating the two propositions of exemplification, which is the reminiscence of Inductive nature of Indian logic as I suggested before.

Dignāga lists ten kinds of Pseudo-examples. Namely,

(1) The positive exemplification which lacks the reason in the formulation of exemplification, as e.g. "Linguistic item is eternal because it is not substantial like an atom."
(2) That which lacks the property to be proved by the reason, as e.g. "Like action."
(3) That which lacks both the reason and the property to be proved, as e.g. "Like a pot."
(4) That which reverses the positive concomitance (*vyatireka*) as e.g. "Whatever is non-eternal is a product of human efforts".
(5) That which lacks the positive concomitance.
(6) The negative exemplification which lacks the reason.
(7) That which lacks the property to be proved by the reason.
(8) That which lacks both.
(9) That which reverses the negative concomitance (*vyatireka*).
(10) That which lacks the negative concomitance.

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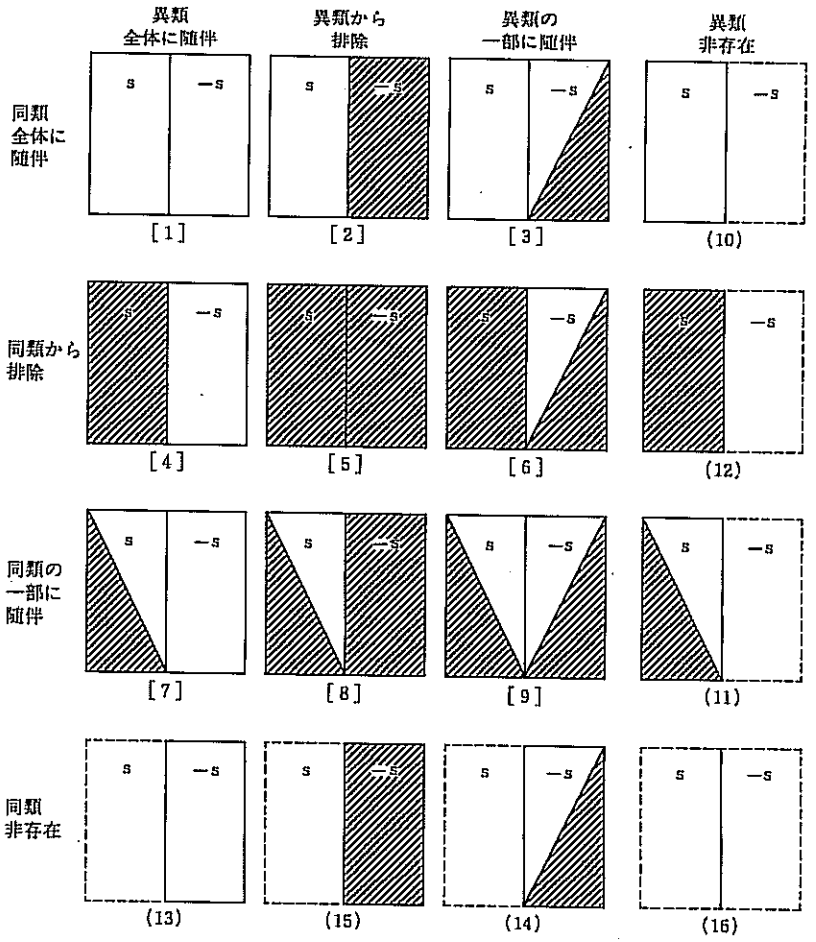
ディグナーガの九句因とウッディヨータカラの十六句因



[1]−[9]がディグナーガの九句因，(10)〜(16)はウッディヨータカラの十六句因の番号

(図2)

[九句因論証式1] [主張] 声は常住である． [理由] 認識対象であるから． [喩例] 虚空の如し，瓶の如し．	[九句因論証式2] 声は無常である． 作られたものであるから． 瓶の如し，虚空の如し．	[九句因論証式3] 声は努力の所産である． 無常であるから． 瓶と稲麥の如し，虚空の如し．
[九句因論証式4] [主張] 声は常住である． [理由] 作られたものであるから． [喩例] 虚空の如し，瓶の如し．	[九句因論証式5] 声は常住である． 聞かれるものであるから． 虚空の如し，瓶の如し．	[九句因論証式6] 声は常住である． 努力の所産であるから． 虚空の如し，瓶と稲麥の如し．
[九句因論証式7] [主張] 声は努力の所産ではない． [理由] 無常であるから． [喩例] 稲麥と虚空の如し，瓶の如し．	[九句因論証式8] 声は無常である． 努力の所産であるから． 瓶と稲麥の如し，虚空の如し．	[九句因論証式9] 声は常住である． 形態をもたないから． 虚空と極微の如し，運動と瓶の如し．

(図3)

できない。九句因の第三・第七・第九も同様に証因が同類にも異類にも見られるから、「不定」と呼ばれる疑似証因に分類される。これらの疑似証因は「同類への随伴」という証因の第二相を満足させるが、「異類からの排除」という第三相を満足させていない。

九句因の第五の「聞かれるものであること」は、主題である声特有の性質であるから、同類(常住なもの)にも、異類(無常なもの)にも全く見られない。従って、声の常住性を確定することは出来ない。これは証因の第三相は満足させるが、第二相を満足させない「不共不定」と呼ばれる疑似証因である。

九句因の第四の「所作性」は、同類(常住なもの)には見られず、異類(無常なもの)の全体に見られるから、主張と反対の「声は無常である」という命題を証明してしまう。九句因の第六とともに証因の第二・第三相をともに満足させず、主張と「相容れない」疑似証因である。

九句因のうち残された第二・第八が正しい証因である。両証因は同類の全体もしくは一部に存在し、異類