

# BUDDHIST LOGIC

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## CHAPTER III.

SYLLOGISM  
(PARĀRTHĀNUMĀNAM).

## § 1. DEFINITION.

The aim of Buddhist logic is an investigation of the «sources» of our knowledge with a view to finding out in the cognized world its elements of Ultimate Reality and of separating them from the elements of Imagination, which in the process of cognition have been added to them. Syllogism is not a source of knowledge. It consists of propositions which are resorted to for communicating ready knowledge to others. It is therefore called by Dignāga an inference «for others». When an inference is communicated to another person, it then is repeated in his head and in this metaphorical sense<sup>1</sup> only can it be called an inference. Syllogism is the cause which produces an inference in the mind of the hearer. Its definition is therefore the following one<sup>2</sup> — «a syllogism consists in communicating the Three Aspects of the Logical Mark to others».

What the so called Three Aspects of the Logical Mark are — we know from the theory of Inference. They correspond to the minor

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synthetical. We may contrast with this attitude the views of Aristotle and all Rationalists, according to whom every *a priori* necessary knowledge is analytical, and of Kant for whom it is always synthetic, (the analytical judgments being mere identical explanations). By a quite different definition of the Category of Identity (*tādātmya*) Dharmakīrti succeeds in giving to the propositions of pure logic and pure mathematics an altogether different basis from the propositions of pure physics. By keeping separate these two specific kinds of knowledge Dharmakīrti comes nearer to Hume, but he differs from him and comes nearer to Kant by establishing the *a priori* necessity of causal relations. The terms analytical and synthetical are very much misleading. First of all synthesis and analysis in the perceptual judgment should be distinguished from those of the inferential (with two concepts). They are confounded, e. g., by Sigwart. *Logik*, I. 141 ff. It would have been better to contrast the two Necessities as static and dynamic. That the really primordial division of the procedure of the human mind must be established in the way of a dichotomy (as every division of concepts *a priori*) dawned upon Kant in the second edition of his Critique (§ 11). He then calls the one class dynamical, the other — mathematical. The dynamical evidently corresponds to Causation, the mathematical — to Coinherence or Identity (of substrate). Kant's attempt to force his twelve-membered division into this double one is by no means clear.

<sup>1</sup> *upacārāt*.

<sup>2</sup> NB., III. 1; transl., p. 109.

and major premises of Aristotle's syllogism and to its conclusion. They are virtually the same in syllogism, but their order is different. An inference is essentially a process of inferring one particular case by its similarity to another particular case. The general rule uniting all particular cases and indicated by the quotation of some examples, intervenes subsequently as a uniting member between the two particular cases. A syllogism, on the contrary, starts by proclaiming the general rule and by quoting the examples which support it, and then proceeds to a deduction of the particular from the general. The order of the premises in the Buddhist syllogism is therefore the same as in the Aristotelian First Figure. It begins with the major premise and proceeds to the minor one and the conclusion.<sup>1</sup>

The difference between the inference «for one self», or, more precisely, «in one self» and the inference in the sense of a cause which produces an inference in the head of a hearer, is thus considerable. The first is a process of cognition containing three terms. The second is a process of communicating a ready cognition and consists of propositions.

In order to understand the position of Dignāga in this point, we must keep in mind his idea of what a source or right knowledge is. It is the first moment of a new cognition, it is not recognition.<sup>2</sup> Therefore only the first moment of a fresh sensation is a right cognition in the fullest sense. A perceptual judgment is already a subjective construction of the intellect. Inference is still more remote from that ultimate source of right knowledge. When knowledge is communicated to another person, the first moment of a new cognition in his head can, to a certain extent, be assimilated to a fresh sensation whose source, or cause, are the propositions of which a syllogism consists.

The following three examples will illustrate the difference as it appears in the three types of the inference «for one self» and in the corresponding three types of the inference «for others».

<sup>1</sup> Cp. with this the indecision of Prof. B. Erdmann (*Logik*<sup>3</sup>, p. 614) regarding this very point. In the last edition of his *Logic* he made the important step of changing the Aristotelian order of premises and putting the minor premise on the first place. He found that this order renders more faithfully the natural run of our thought, i. e., he envisaged syllogism as an inference «for one self». Sigwart thinks that the order in real life can be the one or the other, both are equally possible.

<sup>2</sup> *pramāṇam* = *prathamatarām vijñānam* = *anadhigata-artha-adhigantī*, cf. above, p. 65.

Inference for one self —

1. The sounds of speech are impermanent entities.  
Because they are produced at will, just as jars etc.

This is an inference founded on Identical Reference of two concepts, «impermanence» and «production».

2. There is fire on the hill.  
Because there is smoke, just as in the kitchen etc.

This is an inference founded upon a Causal Relation between two facts.

3. There is no jar on this place.  
Because we do not perceive any, just as we perceive no flower growing in the sky.

This is an inference founded on Negation.

The corresponding three types of a syllogism will have the following form.

1. Whatsoever is produced at will is impermanent, as, e. g., a jar etc.  
And such are the sounds of our speech.
2. Wheresoever there is smoke, there must be some fire, as in the kitchen etc.  
And there is such a smoke on the hill.
3. Whenever we dont perceive a thing, we deny its presence, as, e. g., we deny the presence of a flower growing in the sky.  
And on this place we do not perceive any jar, although all the conditions of its perceptibility are fulfilled.

The difference between Inference and Syllogism is thus a difference between that form of the Inferential Judgment which it usually has in the natural run of our thinking and acting process, and another form which is most suitable in science and in a public debate. In a public debat the universal proposition is rightly put forward as the foundation of the reasoning to which should follow the applying proposition, or the minor; whereas in the actual thought-process the universal judgment is never present to the mind in its necessity, it seems hidden in the depths of our consciousness, as though controlling the march of our thought from behind a screen.

Our thought leaps from one particular case to another one, and a reason seems to suggest itself to the mind. Its universal and necessary connection with the predicate lies apparently dormant in the

instinct and reveals itself only when duly attended to.<sup>1</sup> We have retained the name of Inference for the individual thought-process, because it more closely corresponds to the natural process of transition from one particular case to another one. We have given the name of Syllogism to inference "for others" because of its outward similarity with Aristotle's First Figure. As a matter of fact it is very difficult always to distinguish between what belongs to inference as a thought-process and what to its expression in speech, since we cannot deal with the thought-process without expressing it in some way. The problem is solved in practice so, that the definition of the inferential process, its "axioms", its canon of rules and the capital question of those fundamental relations which control the synthetic process of thought are treated under the head of inference "for one self". On the other hand, the problem of the Figures of the syllogism and the problem of logical Fallacies are dealt with under the head of "inference for others". But even this division of problems cannot be fully carried through. Dharmakīrti<sup>2</sup> treats the important problem of the Figures of a Negative Syllogism under the head of inference "for one self", because, says he, the repeated consideration of Negation through all its different aspects and formulations brings home to us the essence of the Negative Judgment itself.

But although it seems quite right to put in the first place the general proposition as the foundation of the reasoning, nevertheless that form of the syllogism which has survived in the practice of all monastic schools of Tibet and Mongolia belongs rather to the abbreviated form of inference "for one self". The debate, whether didactic or peirastic, does not begin by putting forward the universal proposition, nor are propositions as such used at all. The Respondent begins by stating his three terms, the Subject, the Predicate and the Reason (or Middle term), without caring to put them in the form of propositions. The Opponent then considers two questions, 1) is the Reason (R) really present in the Subject (S) wholly and necessarily, and 2) is the Reason (R) necessarily and universally present in the Predicate (P). Thereupon begins the debate. The two questions if reduced to the phrasing of modern English formal logic will mean, 1) is the Middle distributed in the Minor,

<sup>1</sup> This psychological fact is probably the real cause why some European logicians, as J. S. Mill and others, have characterized the major premise as a kind of collateral notice which helps the mind in its transitions from one particular case to another, *cp. Sigwart, op. cit.*, I. 480.

<sup>2</sup> NB., II. 45 and NBT., p. 37, 11 ff., transl., p. 100 ff.

and 2) is the Middle distributed in the Major. This form of stating the Syllogism has been found through centuries of assiduous practice to be the most convenient for detecting fallacies. The real work of logic begins only when the three terms are clearly and unambiguously singled out. In the diffuse propositional form the real terms are often so concealed as to be difficult of detection.

## § 2. THE MEMBERS OF A SYLLOGISM.

As is seen from the above examples, the syllogism consists of two propositions only. When Dignāga started on his logical reform he was faced by the theory of a five-membered syllogism established in the school of the Naiyāyiks. This syllogism was supposed to represent five interrelated steps of an ascending and descending reasoning. It started by a thesis and ended in a conclusion which was nothing but a repetition of the thesis. The members were the following ones:

1. Thesis. There is fire on the hill.
2. Reason. Because there is smoke.
3. Example. As in the kitchen etc.; wherever smoke, there fire.
4. Application. And there is such smoke on the hill.
5. Conclusion. There is fire on the hill.

From these five members Dignāga retained only two, the general rule including the examples, and the application including the conclusion. Indeed the main point in every syllogism, just as in every inference, is the fact of the necessary interrelation between two terms as it is expressed in the major premise. The second point consists in the application of the general rule to a particular case. This is the real aim of an inference, i. e., the cognition of an object on the basis of the knowledge of its mark. When these two steps are made, the aim of the syllogism is attained, other members are superfluous. It thus consists of a general rule and its application to an individual case.<sup>1</sup>

But the syllogism of the Naiyāyiks contains much more details. It first of all contains a separate thesis and a separate conclusion, although by its content the conclusion is nothing but the repetition of the thesis at the end. The syllogism thus resembles a mathematical demonstration, it begins by proclaiming the *probandum* and concludes by stating that its demonstration has been made. Dignāga

<sup>1</sup> Cp. Bain. Logic, I. 146. — "The essential structure of each valid deduction is 1) a universal ground-proposition, affirmative or negative, and 2) an applying proposition which must be affirmative".

and Dharmakīrti enlarge upon the definition of a correct thesis. Evidently this was a point at issue between the schools of their time. They maintain that a thesis in a public debate should be correctly formulated. But they at the same time maintain that the thesis is not at all an indispensable member of every deduction. It can be safely dropped even in a debate when in the course of debating it is clearly understood without special mention. A thesis according to them cannot be something absurd or contradictory, something which it is not worth the while of proving, and it must be a proposition which the disputant himself believes, which he *bona fide* really intends to prove. It would be bad logic if a philosopher attempted to make capital out of ideas which he does not share himself. Vacaspati remarks that if a philosopher who is known to be an adherent of Vaiśeṣika principles would suddenly take for his thesis the theory of his adversaries, the Mīmāṃsakas, regarding the eternity of the sounds of speech, if he would do it at a public meeting in the presence of authorized judges, he would not be allowed to go on, his defeat would be pronounced at once, before listening to his arguments.

Thus a series of rules were established to which an acceptable thesis must satisfy.<sup>1</sup> But later on this chapter on a correctly formulated thesis gradually sunk into insignificance, since all fallacies of a thesis became merged in the doctrine of false reasons.

According to Dignāga and Dharmakīrti, real members of a syllogism, the necessary members of the logical process, are thus only two, the general rule and its application to an individual instance. The first establishes a necessary interdependence between two terms, the second applies this general rule to the point in question. The first is called Inseparable Connection.<sup>2</sup> The second is called Qualification of the Subject (by the fact of this Inseparable Connection).<sup>3</sup> Its formula, accordingly, is the following one —

R possesses P,  
S possesses R → P.

The conclusion, indeed, as has been noticed also by some European logicians,<sup>4</sup> cannot be separated from the minor premise in the same

<sup>1</sup> Cp. my notes to the transl., v. II, p. 160. 6 ff.

<sup>2</sup> *avinābhāva* = *anantarīyakatva* = *avyabhicāra* = *vyāpti*.

<sup>3</sup> *pakṣa-dharmatā*, also called *pakṣa* simply, cp. N. mukha, p. 12.

<sup>4</sup> Sigwart. Logik, I. 478 n.

degree, as the major premise from the minor. If we give it the rank of a separate member, there is no sufficient reason to deny this rank to the thesis, i. e. to the repetition of the conclusion at the beginning in the guise of a *probandum*, as the Naiyāyikas indeed maintain. «I refute the theory of those logicians, says Dignāga,<sup>1</sup> who consider the thesis, the application and the conclusion as separate members of the syllogism».

Dharmottara<sup>2</sup> says, «There is no absolute necessity of expressing separately the conclusion. Supposing the reason has been cognized as invariably concomitant with the deduced property, (we then know the major premise). If we then perceive the presence of that very reason on some definite place, (i. e., if we know the minor premise), we already know the conclusion. The repetition of the deduced conclusion is of no use».

Thus the real members of the syllogism are the same as the Three Aspects of the Logical Reason which have been established in the inference «for one self», but their order in the inference «for others» is changed.

They are:

- |                                     |                             |
|-------------------------------------|-----------------------------|
| 1. In Similar only,                 | } = Inseparable Connection. |
| 2. In Dissimilar never,             |                             |
| 3. In Subject wholly = Application. |                             |

The first two aspects, as will be established presently, represent only a difference of formulation, essentially they are equipollent.

### § 3. SYLLOGISM AND INDUCTION.

«But then, says Dignāga,<sup>3</sup> (if neither the thesis, nor the application, nor the conclusion are separate members), the formulation of the example does not represent a different member, as it merely declares the meaning of the reason?» The answer of Dignāga is to the effect that «it is necessary to express separately the positive and the negative examples», (in order to show that the reason possesses its two other conditions, besides the condition of being present on the subject of the minor premise). But the example is not to be separated

<sup>1</sup> N. mukha, Tucci's transl., p. 45.

<sup>2</sup> NBT., 53. 16; transl., p. 150.

<sup>3</sup> N. mukha, transl., p. 45.



from the major premise, it is not a separate member. it is inherent in the general rule and in fact identical with it.

The Indian syllogism indeed is not only the formulation of a deductive reasoning, it also contains an indication of that Induction which always precedes Deduction. The general rule, or major premise, is established by a generalization from individual facts which are «examples», they exemplify and support it. An example is an individual fact containing the general rule in itself. Without the examples there is no general rule, nor can the individual facts be considered as examples if they do not contain the general rule. Thus example and general rule, or major premise, are practically the same thing. In order to safeguard against incomplete Induction the examples must be positive and negative. That is to say, that the joint method of Agreement and Difference must be applied. When either no positive examples at all, or no negative ones can at all be found, no conclusion is possible, the result can then be only a fallacy. But the Naiyāyiks regard the example as a separate member of the syllogism, as a separate premise, and give its definition. This, according to Dharmakīrti, is perfectly superfluous. Because if the definition of the Logical Reason is rightly given, the definition of what an example ought to be is also given, they cannot be given separately. The Logical Reason is something that is present in similar instances only and absent in dissimilar instances always. These instances and the reason are correlative, as soon as the reason is defined they also are defined by their relation to the reason. Dharmakīrti delivers himself on this point in the following way.<sup>1</sup> «The essence of a logical reason in general has been defined by us to consist in its presence only in similar cases, and its absence from every dissimilar case. Further, we have specified that the Causal and the Analytical Reasons must be shown to represent, the first an effect (from which the existence of its necessary cause is inferred), (the second a necessarily coexisting attribute) which alone is sufficient for deducing (the consequence). When the reasons are so represented, it is then shown that 1) e. g., wherever smoke exists, fire exists also, like in the kitchen etc.; there is no smoke without fire, like (in the pond and in all) dissimilar cases; 2) wheresoever there is production, there is change, like in a jar etc.; if something is changeless, it is not a product, like Space. It is, indeed, impossible otherwise to show the existence of the reason in similar

<sup>1</sup> NB., III. 123; transl., p. 131.

and its absence from all dissimilar cases.... (it is impossible to exhibit these general features otherwise than by showing) that 1) the causal deduction of the existence of a cause necessarily follows from the presence of the effect, and that 2) the analytically deduced property is necessarily inherent in the fact representing the analytical reason. When this is shown, it is likewise shown what an example is, since its essence includes nothing else».

#### § 4. THE FIGURES OF THE SYLLOGISM.

Since the syllogism is nothing but the expression of an inference in propositions, it is clear that there will be as many different kinds of syllogism as there are kinds of inference. Inference has been defined as the cognition of an object through its mark, and the mark, or the so called Three-Aspected Logical Mark, is nothing but a case of necessary interdependence between two terms. There can be, accordingly, as many varieties of syllogism as there are varieties of conjunction between two terms. We have seen that there are three, and only three, varieties of necessary relation between two terms which allow us to cognize one thing through its necessary connection with the other. We can either cognize a thing through its Effect, or through its being an Inherent Property, or through its Negative Counterpart. There will be accordingly three kinds of syllogism, the Causal, the Analytical and the Negative. They have been exemplified above.

These differences however are founded on the content of the syllogism, not on its form. They are founded upon a difference of logical relations of which a strictly definite table of Categories has been established by Dharmakīrti. There is another difference which affects the mere form of the syllogism. The same fact, the same cognition of an object through its logical mark can be expressed in two different ways. We can call this difference a difference of Figure. Every logical mark indeed has two main features, it agrees with similar instances only and it disagrees with all dissimilar ones. Dignāga insists that it is one and the same mark, not two different ones.<sup>1</sup> A mark cannot be present in similar cases only, without at the same time being absent from all dissimilar cases. But practically, just because the mark is the same, we may attend to its positive side and understand the negative one by implication, or we may attend to the negative side and understand

<sup>1</sup> Cp. N. mukha, transl., p. 22.

by implication the positive one. The mixt method of Agreement and Difference controls the whole domain of cognition, but since there is an equipollency between the positive and the negative part of it, it becomes quite sufficient to express one side alone, either the agreement or the difference. The counterpart of it will necessarily be implied. This is the reason why we have two figures of every syllogism. Figure in this context does not mean a twisted, unnatural and perverse verbal arrangement of the terms of an inference, where the real core of every inference, the universal and necessary interdependence of two terms, becomes quite obliterated; but it means two universal and equipollent methods of cognizing truth on the basis of a necessary interdependence between two terms. We have seen that the perceptual judgment «this is fire» is nothing but a cognition of an object as similar with all fires and dissimilar with all non-fires. The cognition of an invisible fire through its mark, the smoke, is likewise a cognition of its similarity with all places possessing the double mark of smoke and fire, and its dissimilarity with all places where this double mark is always absent. Nay, even the negative judgment «there is here no jar», notwithstanding it is a negative, or, according to Indian phrasing, an inference through «non-perception», can be expressed according to both these methods, the positive and the negative one. Indeed, we may express this judgment in the following way —

Whatsoever, all conditions of perceptibility being fulfilled,  
is not perceived, is absent.  
On this place no such jar is perceived.  
It is absent.

Or we may express the same idea by the method of Difference. We then will obtain the following propositions —

Whatsoever is present, all conditions of perceptibility being  
fulfilled, is necessarily perceived.  
But on this place no such jar is perceived.  
It is absent.

The absence of a jar on a definite spot is cognized either through its similarity with other instances of negation, or through its difference from the positive instances of its presence. The same two methods can be naturally applied to inductions and deductions founded on Causality and to those founded on Identity of objective reference.

An analytical deduction expressed according to the method of Agreement is, e. g., the following one—

Whatsoever is variable in functional dependence on a variation of its causes is non-eternal, like jars etc.  
The sounds of speech are variable,  
They are non-eternal.

The same deduction expressed according to the method of Difference will be thrown in the following syllogistic form—

Whatsoever is eternal is never variable in functional dependence on a variation of its causes, like, e. g., Space.  
But the sounds of speech are variable,  
They are non-eternal.

There are likewise two different figures of every Causal deduction. Expressed according to the method of Agreement is the following causal syllogism—

Wherever there is smoke, there is fire, as in the kitchen.  
Here there is smoke,  
There must be some fire.

The same expressed according to the method of Difference—

Wherever there is no fire, there neither is smoke, as in water.  
But here there is smoke,  
There must be some fire.

The methods of Agreement and Difference are thus in Indian Logic not only «the simplest and most obvious modes of singling out from among the circumstances which precede a phenomenon those with which it is really connected by an invariable law»,<sup>1</sup> but they are the universal methods for establishing every kind of connection, and even every kind of judgment.<sup>2</sup> The one consists «in comparing together different instances in which the phenomenon occurs», the other consists in comparing them with instances in which it does not occur.<sup>3</sup> Dignāga insists that these are not two different methods, but one mixt method of Agreement and Difference, which can either be expressed by attending to its positive or to its negative side. The

<sup>1</sup> J. S. Mill, *Logic*, I, p. 448.

<sup>2</sup> Cp. A. Bain, *Logic*, I. 8 and II. 46.

<sup>3</sup> J. S. Mill, *Logic*, I, p. 448.

presence of fire on a remote hill where only smoke is perceived can be established either by its agreement with the places where both phenomena have been observed to occur, or by its difference from all places where both phenomena have never been observed to occur. The method of Agreement will be then expressed in the major premise of the syllogism, the method of Difference in its Contraposition. They are the two aspects of the Logical Mark as it appears in the syllogism. The first aspect of the Logical Mark in a syllogism is expressed in the positive form of the major premise, its second aspect is expressed in the Contraposition of that premise. But there is no necessity of expressing both figures, because, as already mentioned, «from a formula of Agreement the corresponding formula of Difference follows by implication».<sup>1</sup> Dharmottara<sup>2</sup> says, «When a formulation directly expresses agreement (or the necessary concomitance of the reason with its consequence), their difference, i. e., the contraposition (or the general proposition) follows by implication». «Although the contraposition is not directly expressed, when the concomitance is expressed in its positive form, it nevertheless is understood by implication», «because, says Dharmakīrti,<sup>3</sup> if that were not so, the reason could not be invariably concomitant with the consequence». Both methods equally establish the same circumstance of a necessary tie of dependence between two facts or notions. «And it has been established, says Dharmakīrti,<sup>4</sup> that there are only two kinds of dependent existence, whatsoever the case may be. The dependent part represents either a reference to the same identical thing, or the effect (of another thing which is its cause)». The contraposed general proposition always expresses the same necessary interdependence of two facts following one another, or the necessary connection of two notions referring to one and the same fact. This interdependence (causal or analytical) is «nothing but the general proposition in its positive form». «Thus it is that one single general proposition, either directly or in its contraposed form, declares that the logical mark is present in similar and absent in dissimilar cases».<sup>5</sup>

Thus it is that every syllogism can be expressed in two figures, the one of which corresponds to the «axiom» *nota notae est nota rei*

<sup>1</sup> NB., III. 28; transl., p. 142.

<sup>2</sup> NBT., p. 51. 4; transl., p. 143.

<sup>3</sup> NB., III. 29; transl., p. 143

<sup>4</sup> Ibid., III. 33.

<sup>5</sup> Ibid., III. 34.

*ipsius*, the other to the second axiom *repugnans notae repugnat rei ipsi*. These are the only real logical figures.

That the particular judgments have no place in the syllogism follows from the definition of inference as founded on a necessary and universal connection between two terms, and on the necessary presence of the logical mark in the whole compass of the Subject. As to the negative syllogism, so far Contraposition is not to be regarded as negative in substance, they will be treated and their figures analyzed separately, in a subsequent chapter, together with an analysis of the Law of Contradiction.

### § 5. THE VALUE OF THE SYLLOGISM.

It is clear from what has been stated above that the syllogism is a valuable method only for a correct formulation and communication of ready knowledge to another person. It is not a genuine source of knowledge, its value for the acquisition and expansion of new knowledge is nil. This is first of all quite clear in the syllogism of Causality. «We can assert that the effect represents the logical reason for deducing its cause, says Dharmakīrti,<sup>1</sup> only when the fact of their causal relation is already known». By no effort of ratiocination can we arrive at a deduction of the cause producing an observed smoke, if we do not already know that it is fire. But «in the kitchen and similar cases it is established by positive and negative experience, that there is between smoke and fire a necessary invariable connection representing a universal causal relation». The inference proper consists in applying this general rule to a particular point, and the syllogism communicates this fact to another person. But the essential part of what is communicated by a syllogism is the fact of a necessary dependence<sup>2</sup> of the effect upon its causes. How the principle as well as the particular content of this relation, how its empirical and its *a priori* parts are established, has been explained in the theory of inference,<sup>3</sup> and a syllogism adds nothing but its correct formulation in two or three propositions.

All human knowledge is of relations, and necessary relations, we have seen, are only two, Identity and Causation. The negative relation is here left out of account. Relation, as has been explained, is here

<sup>1</sup> NBT., transl., p. 137.

<sup>2</sup> Ibid., p. 129.

<sup>3</sup> Cp. above, p. 260 ff.

used it the sense of necessary dependence of one term upon another and a necessary interdependence can exist either between two coexisting or two consecutive facts. A necessary coexistence of two different things, we have seen, is always traceable to a necessary consecution or causality between them, so that coexistence proper, coexistence not reducible to causality, coexistence not between two different facts is a coexistence of two necessary conceptions inside the compass of a single fact. It is coexistence, or coinherence, reposing on the Identity of the common substrate of two different concepts. Now the empirical content of this necessary coexistence of two concepts in one substrate, coexistence founded on Identity, is also established by experience, but not by a syllogism. The offices of the latter even in ratiocination are limited to correct formulation and communication. «Indeed a logical reason, says Dharmottara,<sup>1</sup> does not produce cognition of some fact accidentally, as, e. g., a lamp (producing knowledge of such objects which it accidentally happens to illumine). But it produces knowledge by logical necessity, as an ascertained case of invariable concomitance. The function of a logical reason is, indeed, to produce a cognition of an unobserved fact, and this is just what is meant by ascertainment of the reason's invariable concomitance with the latter. First of all (as a preliminary step) we must be certain that the presence of our logical reason is necessarily dependent upon the presence of the predicated consequence, we must do it (in an analytical judgment founded on Identity) by applying the law of contradiction<sup>2</sup> which excludes the contrary. We then will proceed to syllogize, and avail ourselves of the general proposition recorded in our memory, the proposition intimating that its subject is invariably concomitant with its predicate, e. g., «whatsoever is a product is not eternal». After that we can connect this general record with a particular case, «the sounds of speech are non-eternal». Between these (two premises, the major) contains the mnemonic record, it represents the knowledge of the logical reason (and its concomitance). The syllogism (proper is contained in the next step when we in the minor premise), recollect that the causal origin which is inherent in the particular case of the sound is necessarily coexistent with the attribute of non-eternity. If that is so, then the cognition (or communication) of an unobserved thing is, as a matter of fact, nothing but a cognition of invariable concomitance. It is

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<sup>1</sup> NBT., transl., p. 129.

<sup>2</sup> *bādhakena pramānena.*

therefore stated that analytical deductions (founded on the laws of Contradiction and Identity) can be resorted to when the deduced feature is already known necessarily to be present wherever the presence of the reason is ascertained, not in any other cases». The predicate is contained in the reason, the logical consequence therefore necessarily follows out of the mere fact of the presence of the reason.

But if that is so, if the deduced predicate of an analytical judgment is known to be contained in its subject and automatically flows out of the latter, its deduction is worthless.

«Why is it then, asks Dharmottara,<sup>1</sup> that something already quite certain, should be sought after?» «Why should we have recourse to logical reasoning for deducing from the reason what is already given in the reason?»

The answer is that, although the reason and the consequence of an analytical deduction (or the subject and the predicate of an analytical judgment) are connected through Identity, we nevertheless can start on such a deduction, or on such a judgment, albeit we already know that they are necessarily connected through Identity. Just as in the case of deducing the cause from an effect, we must beforehand know from experience that the phenomena are necessarily related as cause and effect, just so must we know from experience, or other sources, that two different features belonging to one and the same reality are connected through Identity. Their Identity is an identity of the common substratum, it is co-substrateness, or co-inherence.<sup>2</sup>

Although all our concepts are constructions of our understanding, their comprehension, their intention, their subalternation, their mutual exclusion are cognized from experience. It has been established above<sup>3</sup> that the laws of Identity, Causality and Contradiction are the original possession of our understanding, but their application is limited to the domain of sensuous experience. Dharmottara gives the following example.<sup>4</sup> Supposing a man having no experience about trees in general perceives a very high Aśoka tree and is informed that it is a tree. He might think that the height of the Aśoka is the reason why it is called a tree. Looking at a small Aśoka he might think that it is

<sup>1</sup> NBT., p. 47. 17; transl., p. 131.

<sup>2</sup> or Agreement, *Uebereinstimmung*, as Sigwart (Logik, I. 110), puts it.

<sup>3</sup> Cp. p. 248 ff.

<sup>4</sup> NBT., p. 24. 3 ff.; transl., p. 67.



not a tree. He will then be taught that the tree is the general term, and the Aśoka a special kind under it. If he then is informed that a certain country-place consists of bare rocks without a single tree on them, he will know that if there are no trees, there are also no Aśokas. The subalternation of all concepts is thus established by «perception and non-perception», i. e., by positive and negative experience, just as the relation of cause and effect between two phenomena, or the relation of their mutual incompatibility. An analytical relation between two concepts can be sometimes established by a very complicated train of argumentation. If the consequence is contained in the reason, this should not be understood psychologically, as a fact really always present to the mind. The analytical relation is logical and capable of infinite extension, it lies sometimes concealed at a great depth. Every case of an analytical relation must be established by corresponding proofs suitable to it, says Dharmakīrti.<sup>1</sup> The principle that all existence is instantaneous has been established by the Buddhists in a long effort of argumentation which is capable of further extension. The connection between these two concepts is analytical, it is protected under the law of Contradiction. If Existence would not be changing every instant, if it would be unchanging like the Cosmical Ether, or like Space, it would not be Existence. But this does not mean that every one who has the idea of Existence present in his mind, has at the same time present the idea of it being instantaneous. An analytical relation means a necessary relation which is not causal, since necessary relations are only two, Identity or non-Causality, and Causality or non-Identity. One and the same thing is called Existence and also a Point-instant. They are connected by Identity. With regard to the necessarily preceding point-instant it will be its effect. There is no third instantaneous relation possible, either Identity or Causality. Every separate instance of such relations, whether analytical relations of concepts or causal relations of point-instants, must be established by experience or, as Dharmakīrti puts it, «by its own proofs». A syllogism will add nothing to our cognition of them, except correct formulation.

#### § 6. HISTORICAL SKETCH OF SYLLOGISM VIEWED AS INFERENCE FOR OTHERS.

Dharmottara testifies<sup>2</sup> that «the Master», i. e. Dignāga, was the first to draw a hard and fast line between inference and syllogism.

<sup>1</sup> *yathā-svam-pramāṇaiḥ*, NBT., p. 47. 5 ff.

<sup>2</sup> NBT., p. 42. 3. Cp. Keith, *Ind. Log.*, p. 106, and Randle, *Ind. Log.*, p. 160.

He envisaged inference as a process of cognition, one of the two «sources» of our knowledge, and called it inference «for one self», or «in one self»; the second was regarded by him not as a source of knowledge at all, but as a method of correctly and convincingly expressing it in a series of propositions for the benefit of an audience. This doctrine, we have seen, is but a consequence of the theory of a difference in principle between the two sources of our knowledge. There are two, and only two, sources of knowledge, because there are two, and only two, kinds of cognized «essences». The senses apprehend the extreme concrete and particular only, inference apprehends the general alone.<sup>1</sup> Regarded as a source of knowledge which stands in a contradictory contrast with sensibility, inference and understanding are convertible terms. Indeed our analysis has shown that inference is nothing but a variety of judgment and judgment is but another name for the procedure of the understanding; inference deals with the general, just as pure sensibility cognizes the absolute particular, or, the thing as it is strictly in itself. Such an inference must be separated from a series of propositions used for conveying a thesis to an audience. We thus not only have a direct testimony of an authoritative author to the effect that the theory of an inference «in one self» and an inference «in others» is due to Dignāga, but we can account for the *rationale* of such a separation, since it is a direct outflow of the fundamental principle of his philosophy.<sup>2</sup>

The statement of Dharmottara is supported by all what we at present know on the history of Indian Logic. We find in the works preceding the reform of Dignāga no mention of the inference «for one self» and «for others». Neither Gotama, nor Kaṇāda, nor Vātsyāyana, nor, for ought we know, Vasubandhu refer to it. But almost every post-Dignāgan work on logic contains it. Praśastapāda who most probably was a contemporary of Dignāga was the first to introduce it in the logic of the Vaiśeṣika school.

Somewhat different was the fate of Dignāga's innovation in the school of the Naiyāyiks. It must be noticed that the original aphorisms of Gotama already contain a distinction between inference as one of the «sources» of cognition (*pramāṇa*) and the «five-membered syllogism» which is treated not under the head of the four «sources» of cognition, but under the head of one of the 16 Topics of Discourse

<sup>1</sup> Cp. above, p. 71 ff.

<sup>2</sup> Cp. my article *Rapports etc.* in the *Muséon*, V, p. 163 ff.

(*padārtha*). It seems as though the innovation of Dignāga were simply borrowed, or extracted, out of these rules of Gotama. However the five-membered syllogism is regarded in the Nyāya school not as an inference evoked in the head of the hearer, but as a faithful and adequate description of the gradual steps of our thought in a process of inference. These steps must be repeated when an inference is communicated to somebody else. The five-membered syllogism is itself already and abbreviation of another, ten-membered, syllogism which was in vogue in that school previously to the establishment of the five-membered one. It aimed at describing all the gradual steps of our inferential cognition, beginning with the first moment of inquisitiveness (*jiñāsā*) and ending in an inferred conclusion. The same psychological standpoint prevails in this school in regard of the five-membered syllogism.

According to the psychological views of the Nyāya-Vaiśeṣika school every thought has a duration of three moments. In the third moment it becomes extinct and inoperative, it wants to be aroused anew in order to become efficient. The inferential process begins by a moment of inquisitiveness which gives rise to the thesis as a first member of a syllogism. The reason and the example follow in its track. The moment of the thesis is extinct and inoperative when the moment of the example appears. The concomitance as a thought contained in one moment would be extinct and inoperative for the conclusion from which it is separated by the moment of the minor premise, unless it would be repeated in that premise. This repetition is called «Reconsideration»,<sup>1</sup> or «Third evocation of the Mark».<sup>2</sup> The first consideration of the mark is, e. g., the perception of smoke in the kitchen, the second—its perception on the hill, and the third—its reconsideration at the time of the minor premise. To this «reconsideration», in the form «here is that very smoke which always is concomitant with fire», is assigned the office of being the proximate and immediate cause of the conclusion—«there must be some fire present on the hill».

It is clear that the Naiyāyiks did not regard at first their five-membered syllogism as consisting in mere propositions intended to communicate ready knowledge to some audience. Dignāga's view was however accepted by Uddyotakāra.<sup>3</sup> The Naiyāyiks followed

<sup>1</sup> *parāmarṣa*, cp. NV., p. 46. 10 ff.

<sup>2</sup> *trīya-linga-parāmarṣa*.

<sup>3</sup> NV., p. 18. 10 — *vīpratipanna-puruṣa-pratīṣṭakatvam*.

the example of the Vaiṣeṣikas and incorporated the theory of an inference «for others» in their logical teaching. We meet with the distinction between an inference for one self and for others in the works of Gangeśa and in all the works which followed.

The same remark must be *mutatis mutandis* applied to another characteristic feature of the Indian Logic, its doctrine of syllogistic figures. That there are two, and only two, real figures and that all particular judgments have no place in a syllogism was admitted by the schools long before Dignāga, but the discovery of the real meaning of this fact must be credited to him.

The positive and negative figure or, more precisely, the *modus ponens* and *modus tollens*, just as they are admitted by the Naiyāyiks probably have been admitted by the Sāṅkhyas before them. But for the realistic schools they are two independent forms of syllogism, whereas for the Buddhists every syllogism can be expressed either in the one or in the other form, since both forms are equipollent. As a proof of their independence the Naiyāyiks adduced the fact that there are deductions «purely positive»<sup>1</sup> which have no negative counterpart and there are also deductions «purely negative»<sup>2</sup> which have no positive counterpart. This the Buddhists denied and maintained that every deduction is positive and negative, just as all names and all judgments are necessarily in their essence, positive and negative.

The name «fire» and the judgment «this is fire» means that there is a real point which on the one side is similar with all fires and, on the other side, is dissimilar from all non-fires. The middle is excluded,<sup>3</sup> there is no third thing possible between being a fire and being a non-fire. Just the same applies to all inferences and syllogisms.

The Sāṅkhyas, it would seem, were the first to make an extensive use of the *modus tollens* for the establishment of their theory of Causality. They maintained the essential identity of cause and effect, i. e., the preexistence of the effect in its cause. Their aim was to support in this way their favorite idea of an Eternal Matter and the inclusion of all the universe of effects in this unique and universal Cause. They produced for its proof a canon of five syllogisms expressed *modo tollente*.<sup>4</sup> They are the following ones —

<sup>1</sup> *kevala-anvayin*.

<sup>2</sup> *kevala-vyatirekin*.

<sup>3</sup> *tṛtīya-prakāra-abhāva*.

<sup>4</sup> *avīta-pañcakam*, cp. NK., p. 30; the term *avīta* is rendered in Tibetan by *bsal-bas hoñ-pa* «arrived in the way of exclusion» = negative, or *tollens*. On the

1. If the effect did not preexist, it never could be created out of nothing.  
However it is created.  
Therefore it does preexist (in its material cause).
2. If the effect did not preexist in its material cause, it would not be homogeneous with it.  
But cloth is homogeneous with threads, and not with the weaver (who also is a cause).  
Therefore the effect preexists in its material cause.
3. If the effect did not preexist in its material cause and if it did preexist elsewhere, then the cloth would not be produced out of thread, but could be produced out of straw etc.  
However the cloth is produced out of threads and is not produced out of straw (like a matt).  
Therefore it preexists in the threads.
4. The capacity to produce something requires an object upon which it is directed; if this object does not preexist, the force cannot be efficient.  
However the forces are efficient.  
Hence their objects preexist (in their material cause).
5. A cause is relative to an effect, if the effects did not preexist, there would be no causes altogether.  
But the causes exist.  
Hence the effects must preexist (in their causes).

These five Mixed Hypothetical Syllogisms expressed *modo tollente* are according to the Sāṅkhyas an independent way of proof. According to Dignāga<sup>1</sup> they are not independent, since every *modus tollens* presupposes the existence of a *modus ponens* with which it is virtually identical. Dharmakīrti proves convincingly that the syllogism of Agreement and the syllogism of Difference are but two figures of the same syllogism, the one establishing exactly the same thing as the other. Every syllogism and every inference are thus positive and negative at the same time.<sup>2</sup>

The «purely positive» and the «purely negative» syllogisms are an invention of Uddyotakāra.<sup>3</sup> Animated by his extreme hatred of

<sup>1</sup> *avāta* cp. NV., p. 123, Sāṅkhya—Kaum. 5; H. Jacobi in *Aus Indiens Kultur*, p. 8 ff.

<sup>2</sup> Cp. N. mukha, p. 22.

<sup>3</sup> Cp. *definitio est omnis negatio*.

<sup>4</sup> NV., p. 48. 10 ff.

Buddhism and all things Buddhist he most vehemently assails. Dignāga's definition of inference, his theory of the Three-Aspected Logical Reason, his doctrine of syllogistic figures, his system of logical fallacies, etc. He pours upon them a stream of quite artificial, falsely subtle criticisms in order rather to bewilder than to convince the reader. The greatest part of these inventions were dropped in the sequel, but the theory of the purely-positive and purely-negative reasons remained for ever as a part of the Naiyāyika syllogistic teaching. The favourite syllogism of the Buddhists, e. g., «everything having a cause is impermanent», will, according to the Naiyāyiks, be purely positive, or a logical fallacy. There are no uncaused things for the Buddhists, since every thing existing has necessarily a cause. Uncaused things do not exist. But the Buddhists maintain that there is a negative example, viz., the ubiquitous, unchanging, motionless Cosmical Ether, or the Space. A negative example need not be a reality. For logical purposes, serving as a contrast, such an example as eternal Space is quite sufficient.<sup>1</sup>

An inference like «the living body possesses a Soul, because it possesses animal functions» is an instance of «purely negative» inference. There are no positive examples to prove this concomitance of a living body with a Soul, but there are a lot of examples where these two attributes are both absent. According to the Realists these examples have the force to prove the invariable connexion of the living body with a Soul. According to the Buddhists they prove nothing, the deduction is a fallacy. The negative examples are a corollary from the positive ones. If there are no positive ones, neither can there be any real negative ones.

### § 7. EUROPEAN AND BUDDHIST SYLLOGISM.

In the present condition of our knowledge of the Indian Syllogism it may seem premature to attempt a full comparative statement and estimate of the Buddhist theory as against the European. Nevertheless some hints in that direction will not be amiss as a help for a better understanding of the Indian position, of that independent and original view which the Indian logicians took in dealing with Syllogism. The following points of the Aristotelian theory deserve to be considered, 1) Aristotle's idea of the Syllogism in general, 2) his idea of a Syllogism from Example, 3) his idea of Induction, 4) the real members

<sup>1</sup> N. mukha, p. 27; NBT., p. 87. 3.

of a Syllogism, 5) its real Figures, 6) its Axiom and the import of the Mixed Hypothetical Syllogism.

a) Definitions by Aristotle and by the Buddhists.

According to Aristotle a Syllogism is «a speech in which, some positions having been laid down, something different from these positions follows as a necessary consequence from their having been laid down».<sup>1</sup> This definition implies that the syllogism consists of three propositions (at least), and one of them (the conclusion) follows necessarily from the two others (the premises). It is clear however that the syllogism is not only «a speech». Apart from the expression in «a speech» there is the thing to be expressed in that speech. The contents of a syllogism has been characterized by Aristotle in the *Dictum de omni et nullo*, meaning that «Whatever is affirmed or denied of a class, is affirmed or denied of any part of that class». According to this rule the Syllogism must always contain a deduction of the particular from the general. There is also another way of stating the contents, or, as it is called, the «axiom» of the Syllogism. It is the principle *nota notae est nota rei ipsius* with its correlative *repugnans notae repugnat rei ipsi*. According to this «Axiom», the syllogism contains the cognition of an object through an intermediate mark. It represents an indirect cognition as distinguished from the direct cognition through the senses. We have already mentioned that the Buddhist definition of Inference as cognition of an object through its mark coincides with the principle *nota notae*. Its expression in a sequence of propositions will therefore correspond to Aristotle's «speech». We thus find in the European theory something corresponding to the Buddhist distinction of the Inference «for one self» from the Syllogism «for others». But in this point lies also the great difference between the two theories.

In the Buddhist Inference-for-One-Self there are, properly speaking, no propositions at all, at least no such propositions as always are present in the Aristotelian Syllogism. The cognition of the form «sound is impermanent, because it is a product, like a jar» is laid down in a single proposition. The important part is not the proposition, but its three terms, or, if the Example is counted, its four terms. We thus are faced by two quite different definitions of Syllogism. The one says that it is a «speech» in which the concluding

<sup>1</sup> Grote's translation, op. cit., p. 143.

proposition necessarily follows from two premises; the other says that it is a "speech" which expresses the Three-Aspected Logical Mark,<sup>1</sup> i. e. the mutual relation of the three terms.

Thus it is that, notwithstanding the identity of the "axiom" of the Syllogism, there is a great difference between both theories in the importance given to the "speech" in which it is laid down. For Aristotle Syllogism is, first, a series of three propositions, next, a *Dictum de omni et nullo*; for Dignāga Syllogism (and Inference) is, first, three interrelated terms; next, a sequence of two propositions, expressing a general rule and its application.

### b) Aristotle's Syllogism from Example.

Apart from this distinction between what a Syllogism is and the fact which it essentially expresses, there is in the Aristotelian theory another distinction which Aristotle himself characterizes as a difference between Syllogism for us (*pro nobis*) and Syllogism in its own nature (*notius natura*). The designation "for us" suggests some similarity with the Buddhist Inference "for one-self".

The antithesis between *notiora natura* and *notiora nobis* (or *quoad nos*) is recognized by Aristotle as a capital point in his philosophy. The first is nearer to perception, more within the apprehension of mankind generally and constitutes Experience. The second is nearer to final or perfect knowledge and constitutes Science.

Aristotle counts several varieties of Syllogism which he brings under the head of knowledge for one-self. The principle are the Syllogisms from Example and the Syllogism from Induction.

The nearest to the Indian Inference-for-One-Self is the Aristotelian Syllogism from Example. The Example is here, just as in India, considered as a fourth term, besides the three terms, the major, middle and minor.<sup>2</sup> The inference is from one particular case to the general and through the general to another particular.

Example includes not all, but only one or few particulars; inferring from them, first, to the entire class, next, to some new analogous particular belonging to the class. The ratiocinative process consists of two parts, an ascending one and a descending one. Inference proceeds from one particular instance to other similar instances through an intermediate general premise which is, if not expressly stated,

<sup>1</sup> *trirūpa-linga*.

<sup>2</sup> Grote, op. cit., p. 191.



always included in the Example. From this point of view one must admit that the five-membered Syllogism of the Naiyāyiks alone does full justice to this double march of the ratiocinative process. Indeed its three first members contain four terms. The order of the premises is inverted. The Syllogism starts at its conclusion which is also the thesis. It then mentions the minor premise. The third member is the Example. The major premise is not a separate member. We then have the following syllogistic form —

1. Thesis. Sound is impermanent.
2. Reason. Because it is produced by effort.
3. Example. Like a jar.

This represents the natural march of the intellect when it leaps from one particular to another. The major premise is not fully realized, but it lies burried somewhere in the depths of consciousness and emerges to the surface when the next step, or deduction, is taken. The Syllogism then receives the following shape:

1. Thesis. Sound is impermanent.
2. Reason. Because produced at will by an effort.
3. Example. Like a jar. Where an effort there impermanence.
4. Application. Sound is produced at will by an effort.
5. Conclusion. It is impermanent.

This seems to be exactly the Syllogism which Aristotle had in view in establishing his Syllogism from Example. He refers it to the class of inferences for one self, *notiora quoad nos*. For the Naiyāyiks however — only its three first members, with the suppressed major premise, represent inference for one-self. Its full five members they consider as inference for others or as a full Syllogism to be used in a public debate.

It seems that the celebrated modern theory of J. S. Mill who considers Syllogism as a process of inferring particulars from particulars with a suppressed collateral major premise, which is the result of passed experience, corresponds in its main points to the theory of the Naiyāyiks.

### c) Inference and Induction.

That the universal or the major premise must be established by Induction from particulars is equally maintained by the Buddhists and by Aristotle. Syllogism presupposes and rests upon the process of

Induction. Aristotle declares unequivocally that universal propositions are obtained only from Induction.<sup>1</sup> The particular facts remembered and compared constitute Experience with its universal notions and conjunctions.<sup>2</sup> «Conjunctions, says Dharmakīrti, (or the major premise) must be established by corresponding (particular) facts».<sup>3</sup> If this really is so, it seems impossible or quite artificial to cut the natural inductive-deductive process of thinking into two different halves, Induction and Deduction. Both are complementary of one another and cannot be separated otherwise than in abstraction. This is, as we shall see, the substance of the Indian view. We shall see that the link between Induction and Deduction is so strong that the figures or moods of Deduction can be rightly established only when the principle methods of Induction are taken into account. There is between the two parts a natural antithesis, inasmuch as we in life sometimes concentrate our attention on the inductive process and suppress, as it were, the deductive one. This is called inference for one self. Or we presuppose the process of Induction as already achieved and direct all our attention to the second part of the process, to deduction. This is called inference for others by the Indians, or the real, genuine Syllogism (*notius natura*) by Aristotle. But the name of Syllogism is applied by Aristotle to both Induction and Deduction. The Syllogism from Induction is in his treatment a very special kind of Syllogism in which there is no real middle term, because the supposed middle reciprocates with the major. The order of the premises is inverted just as in the Syllogism from Example. The conclusion in which it results is the first or major proposition. Aristotle adds that the genuine Syllogism, which demonstrates through a middle term, is *notius natura*, it is prior and more effective as to cognition; but that the Syllogism from Induction is to us (*pro nobis*) plainer and clearer.<sup>4</sup>

The Syllogism from Induction, as imagined by Aristotle, must have the following form —

Conclusion (= thesis). One man and all observable humanity are mortals.

Minor premise. They represent the totality of humanity.

Major premise (= conclusion). All men are mortal.

<sup>1</sup> Grote, op. cit., p. 187.

<sup>2</sup> Ibid., p. 193.

<sup>3</sup> *yathā-svam-pramāṇaiḥ*, NBT., p. 47.1 ff., on the meaning of *pramāṇa* in this context cp. NBT., p. 64.1, 81.1.

<sup>4</sup> Grote, op. cit., p. 191 and 196.

Such a syllogism is not only a process ascending from the particular to the universal, it contains moreover an unwarranted jump from the observed totality of a class to its absolute totality. However Aristotle conceives repeated and uncontradicted Induction as carrying with it the maximum of certainty and necessity.<sup>1</sup> The Universal (*notius natura*) is thus generated in the mind by a process of Induction out of particulars which are *notiora nobis*.

Both Dignāga and Aristotle, it is true, content themselves with barely recognizing the inductive part of ratiocination, while they both bestow elaborate care upon the analysis of the deductive part and of the canon of rules regulating it.

Some critics have impugned the procedure of Aristotle in his converting Induction into a peculiar form of Syllogism and thus effacing the great contrast between the ascending and descending process in ratiocination. For them the capital difference between both processes lies in the constraining force or necessity inhering in Syllogism, a necessity which Induction never can attain.<sup>2</sup> Every Induction, according to them, includes a jump, and an unwarranted, risky jump, from particular cases to the universal assertion. But there is no unwarranted jump, there is strict necessity in syllogistic deduction. The distinction between the totality of particulars and the meaning of the class-term, these critics maintain, is incorrectly employed by Aristotle to slur over the radical distinction between Induction and Syllogism. Aristotle says: «you must conceive the minor term in the Inductive Syllogism as composed of all the particulars; for Induction is through all of them».<sup>3</sup> According to these critics the unwarranted jump from particulars to the class can be admitted in Induction without spoiling it. But its admission into Syllogism must be refused, because it would degrade the dignity of that method. It seems that in this question as in many others the Indian view deserves to be considered. The difficulty is inherent in knowledge itself. It cannot be slurred over by dividing the full ratiocinative process in two halves and relegating it to one half only, thereby getting another half which becomes quite innocent of the flaw of the first half. The universality and necessity of judgments is the core of all logic, it must be explained in some way or other. As long as it is not explained, neither Induction nor Syllogism will appear innocent, an internal disease, a «cancer»,

<sup>1</sup> *Ibid.*, p. 192 ff.

<sup>2</sup> *Ibid.*, p. 197.

<sup>3</sup> *Ibid.*, p. 260.

as the Hindus say, will be lurking in them. The Buddhist solution is explained by us in the chapter on Inference and will be considered once more later on.

d) The Buddhist Syllogism contains two propositions.

It follows from the Aristotelian definition that the Syllogism must consist of three propositions, two of them exercising a similar function and united by the common characteristic of being «premises» to the Conclusion. From the Buddhist definition it follows that the Syllogism must consist of only two indispensable propositions, the one expressing the general rule of invariable concomitance between the reason and its consequence, and the other expressing the application of the rule to a given instance. Indeed the connection between the minor premise and the conclusion is much narrower than between the two so called premises. Lotze and Sigwart remark rightly that the «minor premise presupposes the conclusion».<sup>1</sup> The minor with the conclusion together constitute the Application or Qualification of the Locus.<sup>2</sup> It is easy to see that the two indispensable members of a Syllogism represent nothing else than Induction and Deduction. The real evidence whereby the conclusion of a Syllogism is proved, is the minor premise together with, not the major premise itself, but together with the assemblage of particular facts from which by Induction the major premise is drawn.<sup>3</sup> Example and Application are the two members of the Buddhist syllogism, as stated above.<sup>4</sup>

e) Contraposition.

The Indian theory deals with conversion and obversion of subject and predicate in propositions merely in connexion with inference and syllogism. Conversion is possible only in the major premise, or grounding proposition. In the applying proposition, which is a combination of the minor premise and the conclusion, the subject has a fixed position which cannot be changed. The grounding proposition expresses

<sup>1</sup> Lotze, *Logik*, p. 122; Sigwart, *op. cit.*, I. 478,—«Socrates could not be a man, as stated in the minor premise, if we were not already sure that he is mortal».

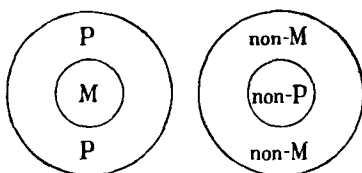
<sup>2</sup> *pakṣa-dharmatū*.

<sup>3</sup> Grote, *op. cit.*, p. 199.

<sup>4</sup> Cp. above, p. 279.

the fact that the reason, or middle term, is present in similar instances only and absent in dissimilar instances always. These are the two rules of the major premise which imply one another, because if the reason is present in similar instances only, it is *eo ipso* absent in dissimilar instances always. But in order to express the necessary dependence of the reason upon the predicate both must be stated, either expressedly or by implication. The presence of the reason in similar instances only is the Position.<sup>1</sup> Its absence in dissimilar instances always is the Contraposition.<sup>2</sup>

The position is established by the inductive method of Agreement. The Contraposition is established by its corollary, the method of Difference. Both express one and the same fact. They are two manners of expressing the same idea. The logical value and validity of contraposition is easy to understand. It is clear that if the middle term is necessarily dependent upon the major, it is included in the latter. The compass of its negation must therefore exceed the compass of the negation of the major in exactly the same proportion in which the compass of the major exceeds the compass of the middle. In circles this can be represented so —



E. g., «whatsoever is a product (M) is non eternal (P)» and «whatsoever is eternal (non-P) is not a product (non-M)»; or «wheresoever there is smoke (M), there is fire (P)», and «without fire (non-P) there is no smoke (non-M)». The whole compass of M is included in the compass of P. The non-P remains outside the greater circle. And because non-P is outside, non-M is still more outside. Thus the whole of non-P is embraced by the non-M.

That the universal negative can be converted is equally clear. If there is no connection at all between subject and predicate, this disconnection is mutual.

But the universal affirmative cannot be converted. It expresses the necessary dependence of one term upon the other. This relation can-

<sup>1</sup> *anvaya*.

<sup>2</sup> *vyatireka*

not be reversed. The subject has a fixed position just as the subject of the conclusion. A great many fallacies owe their origin to the neglect of that rule. E. g., if we have the proposition «whatsoever is produced by an effort is non-eternal» and convert it simply, we shall have «whatsoever is non-eternal is produced by an effort». This will be a fallacy of Uncertain Reason, since the reason «non-eternal» will be equally present in similar instances like jars etc. and in dissimilar ones like lightning etc.

Aristotle's dealing with the problem of Conversion is formal and grammatical. He tries to change the mutual positions of subject and predicate. He then sees that the same operation is possible in some instances and, quite incomprehensively, impossible in other cases.

Among the European logicians Sigwart holds views which fall in line with the attitude of the Indians. He insists that the position of being a predicate must be «left to what really is the predicate».<sup>1</sup> «All the meaning of Contraposition, says he, becomes at once clear when we put the connection into the form of a hypothetical proposition, and instead of maintaining that „all A are B“ express that „if something is A it is also B“. It follows that „if something is not B, it neither is A“. «A good sense and a (logically) valuable sense have only these two cases, pure Conversion (of the negative) and Contraposition. They from all sides express the meaning of the assertion that a predicate belongs, or does not belong, necessarily to its subject. All other cases which result merely in particular propositions, demonstrate therewith that no definite conclusion is possible».

That is the reason why the Indian theory excludes particular propositions from the domain of logic altogether. Logic is the province of universal and necessary propositions.

#### f) Figures.

The Aristotelian Logic distinguishes between the Categorical and Hypothetical Syllogism and divides the Categorical in 4 Figures and 19 Moods. On the division in Categorical and Hypothetical, on the question, namely, how far this division affects the grammatical form alone or belongs to the essence of inference, some remarks will be made later on. But the division into 4 figures and their 19 moods, just as the theory of Conversion, is founded on the grammatical principle of the position of the Middle term in both premises.

<sup>1</sup> Op. cit., I. 451.

Grammatically the middle term can be subject in the major and predicate in the minor, or *vice versa*, subject in the minor and predicate in the major, or subject in both, or predicate in both. One of the premises can be moreover either particular or negative. By combining each of the four positions of the middle term with the possibility of one of the premises being either particular or negative, a scheme of 19 valid moods is constituted. Only one of them, the first mood of the first figure (*Barbara*), is regarded by Aristotle as «final» or genuine. All others can be by a complicated process of reduction converted into it.

Of all this complicated doctrine which forms almost the entire edifice of mediaeval and modern Formal Logic we find on the Indian side not a whisper. Particular conclusions are, first of all, excluded altogether from the domain of logic in India. A particular conclusion means that the Reason is not present in the whole compass of the Subject. This is a violation of the first rule of the canon and produces a fallacy. Negative conclusions are relegated by the Buddhists to a special class and altogether separated from universal affirmative conclusions. The third and fourth syllogistic figures are thus excluded from the domain of syllogism. The complicated rules for their reduction and validity become therefore quite superfluous. Neither can the grammatical principle of converting the Middle Term into the predicate of the major premise and into the subject of the minor be rightly introduced into logic. Among the three terms of an inference one (the minor) is the Subject, it is the real Subject, the logical Subject. It cannot be converted into a predicate otherwise than in a confused and perverse expression. The subject of the minor premise and the subject of the conclusion are the same thing and must occupy in a correct expression the same position, it is the subject of the applying proposition. The subject of the grounding or major proposition is necessarily the Middle term, because this proposition expresses the necessary dependence of the middle on the major, and this fact is expressed linguistically by bringing it under the predication of the major. «Let the predicate be what predicate is», says Sigwart.<sup>1</sup> Every change in his position is superfluous and useless. We are thus left with one of the moods of the first figure (*Barbara*),

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<sup>1</sup> Sigwart, op. cit., I. 451. In the first mood of the second figure (*Camestres*) the Middle term is supposed to be the predicate of the major premise. But the middle which is a predicate in the major premise is *contradictio in adjecto*. This is

and one of the moods of the second figure (*Cesare*), the last corresponds to the contraposition of the first. We have already explained that in a contraposition the middle can really exchange its place with the major, because both these forms are two different but equipollent ways of expressing one and the same fact. This double expression is not the result of arbitrarily changing the places of subject and predicate, but they represent the two universal procedures of knowledge, inductive as well as deductive.

The Buddhist theory divides Syllogism and Inference in three kinds according to its content. They are the Analytical, the Causal (=Synthetical) and Negative deduction. From the formal side each of them can be expressed either according to the method of Agreement or according to the method of Difference; the first will be a *modus ponens*, the second a *modus tollens*, of the Mixed Hypothetical Syllogism.

There are according to Dignāga these two, and only two, figures in Syllogism, accordingly as the major is expressed in the form of a Position or in the form of a Contraposition. Both forms are always possible, they are complementary of one another, they both express the same thing and when the one is expressed the other is implied, even if it is not expressed. They correspond to the second and third rule of the syllogistic canon, viz., the presence of the reason in similar instances only and its absence in dissimilar instances always. Dharmottara says,<sup>1</sup> «The meaning is the aim of the syllogism, the real fact which must be expressed by it, it is the fact concerning which both the syllogisms (of Agreement and of Difference) are drawn. There is no difference whatsoever in the fact which they aim at establishing. Indeed, the aim is to express a logical connection... Although they represent two different methods, they express just the same fact of one logical connection... The expressions differ so far the *prima facie* meaning is concerned, but regarding the aim for which they are used, there is no difference. Indeed, when the direct or positive concomitance has been expressed in the major premise, its contraposition follows by implication... And likewise, when the contraposed concomitance has been expressed, its positive form follows by implication».

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only possible by transposing the premises. Bain says (op. cit., p. 140) — «A much greater variation from the standard negative (*Celarent*) is observable here (in *Ca-mestres*). The grounding proposition which must be universal is the minor premise: so that there is an inversion of the normal order of the premises».

<sup>1</sup> NBT., p. 43. 2 ff.; transl., p., 115.



Now if the field of the Syllogism is divided in European formal logic in 19 moods and in the Indian system in only two moods, the questions naturally arise, 1) what is the correspondence, if any, between the 19 European moods and the 2 Indian ones, 2) what is the comparative logical value of both these divisions. As already stated, the third and fourth figure of the European Syllogism need not to be considered in this context, since they yield only particular conclusions, which by themselves without reduction are logically valueless. For the same reason are the third and fourth moods of the first and of the second figure to be excluded, since they also give only particular conclusions. The first mood of the second figure represents a perverse expression concealing a real fallacy.<sup>1</sup> From the moods of the second figure remains the second mood (*Cesare*) which is the contraposition of the first mood of the first figure (*Barbara*) and therefore corresponds to Dignāga's positive or direct figure. As to the second mood of the first figure (*Celarent*), its negation is nothing but linguistic. All really negative conclusions, we shall see, are reducible to the type-instance "there is here no jar, because we do not perceive any". But since all names, as will be shown later on, are positive and negative names, it is always possible to disguise a positive conclusion in a kind of negative judgment. E. g., we can say —

All men do not live eternally,  
Socrates is a man,  
He does not live eternally.

This conclusion differs from the conclusion "Socrates is mortal" only linguistically. Or take the Indian type-instance —

All products are not eternal,  
Sounds are produced,  
They are not eternal.

It has no sense at all to erect this linguistic difference into a separate mood. Since every judgment and every name can be expressed both ways, positively and negatively, it seems more convenient, as the Indians have done, to treat the problem of Negation separately as a feature of our thought which may appear everywhere instead of doubling all figures and moods, without ever considering the real nature of Negation.

The same critique applies to the distinction between the moods with a general and particular conclusion, since the second is included

<sup>1</sup> Since the Middle cannot be the predicate of the major premise.

in the first. Dharmottara<sup>1</sup> delivers himself on this subject in the following way — «The subject of an inference is a combination of a (singular) part perceived directly and a part not actually perceived... E. g., when it is being deduced that the sound represents an instantaneous Ens, only some particular sound can be directly pointed to, others are not actually perceived». That is to say, that in the above type-instance the term «sound» means «all sounds», «some sounds» and «one sound». But it has no sense to constitute these three possibilities into three different items in a classification, because the difference is unimportant and its distinction a useless subtlety.

Thus it is that the two moods of Dignāga correspond to the first mood of the first figure (*Barbara*) and to the second mood of the second figure (*Cesare*) of the Aristotelian syllogism.

We may now touch upon the question of the comparative value of the statement that there are only two figures of syllogism and the theory which conceals these two real figures in an artificial scheme of 19 moods.

Some writers have assumed that the comparative simplicity of Dignāga's table is a sign of inferiority. Others, on the contrary, have preferred the simple theory to the complicated one. Sigwart<sup>2</sup> says — «If we reduce the necessary rule according to which a deduction is made (in the first figure) to its corresponding formula, we shall have — if something is M it is P. If we then assume that S is M, the result will be that S is P».

«The same rules, he continues, must underlie the second figure, because there can be no other consequence from the simple relation of concepts. But we conclude here from the absence of the (necessary) consequent to the absence of its (necessary) antecedent». «Therefore, says the same Sigwart,<sup>3</sup> the first two figures of Aristotle coincide exactly with what we have stated in a former section», i. e., that the real moods of the syllogism are only two, the *modus ponens* and the *modus tollens*.<sup>4</sup> «The connection and the difference between the first and the second figure is elicited by the simple fact that in the first we conclude from the validity of the antecedent ground to the validity of its necessary consequence (positive or negative), whereas in the second figure we conclude from the absence of the necessary

<sup>1</sup> NBT., p. 31. 21, transl., p. 89.

<sup>2</sup> Op. cit., I. 485.

<sup>3</sup> Op. cit., I. 466.

<sup>4</sup> Cp. *ibid.*, p. 465.

consequence to the absence of its necessary antecedent ground». These two figures coincide with the *modus ponens* and the *modus tollens* of the Mixed Hypothetical Syllogism.

This is also admitted by J. N. Keynes.<sup>1</sup> After having made a statement of the two moods of the Mixed Hypothetical Syllogism, he remarks — «These moods fall into line respectively with the first and the second figures of the categorical syllogism. For we have seen that in the figure 1 we pass from ground to consequence and in figure 2 — from denial of consequence to denial of ground».

According to Kant<sup>2</sup> the rule of the second figure is this, that «what contradicts the mark of a thing contradicts the thing itself», i. e., *repugnans notae repugnat rei ipsi*. He then shows that the second figure can always by contraposition be converted into the first. This again falls in line with the Buddhist theory according to which the two figures of the syllogism are nothing but the major premise and its contraposition, or the two rules requiring the presence of the reason in similar instances only and its absence in all dissimilar ones.

If we summarize the critique which has been bestowed upon the Aristotelian scheme of figures and moods, we find 1) that it was an unhappy idea of Aristotle to change the natural positions of Subject and Predicate in the premises, 2) that it was inconvenient to introduce in it other negative moods than the *modus tollens* or Contraposition, 3) that it was useless to introduce particular conclusions which could be valid only as far as reducible to the first figure. «It cannot be denied, says Kant,<sup>3</sup> that valid conclusions are possible in all the four figures. But it is the aim of logic to disentangle and not to entangle, to enunciate every thing openly and simply, and not in a concealed and perverse manner». «It is easy to discover the first inducement to the false subtlety (of the Aristotelian figures). The man who was the first to write down a Syllogism in three propositions, the one above the other in three lines, considered it as a chess-board and tried to change the positions of the middle term and to observe the consequences. When he saw that valid conclusions emerged, he was struck just as when an anagram is found in a name. It was as childish to rejoice about the one as about the other».<sup>4</sup> Kant therefore

<sup>1</sup> Formal Logic, p. 352.

<sup>2</sup> In his small tract „Von der falschen Spitzfindigkeit der vier syllogistischen Figuren“.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

calls the Aristotelian doctrine «false subtlety», and Sigwart falls in line by characterizing it as «superfluous specification». The two figures established by these two leaders of European science are exactly those that are established by Dignāga. «False subtlety» and «superfluous specification» are also found in India and even in a much higher degree than with Aristotle. We will see that Uddyotakāra, wishing to overdo Dignāga's computation of the nine positions of the Reason between instances Similar and Dissimilar, has adopted the method of superfluous and irrelevant specification and false subtlety. He then easily reached the total number of 2032 middle terms, right and wrong together!

### g) The Causal and Hypothetical Syllogisms.

Our arguments, according to Dharmakīrti, are founded upon two great principles, the principle of Identity and the principle of Causation.<sup>1</sup> We speak only of positive arguments, leaving the negative ones for special consideration. The Identity, we have seen, is not the logical identity of two concepts. The Identity which Dharmakīrti has in view is the identity of that reality which underlies two different concepts. These concepts are united by the identity of their objective reference. A conception is not a fiction of pure imagination, but real knowledge only as far as it possesses an objective reference. Dharmakīrti's principle could also be expressed thus — all logical connection of two concepts is founded either upon Identity of their one and the same objective reference, or upon Interdependence of their two different references.

The objective reference of two interdependent concepts can be either the same or, if it is not the same, it must consist of two different, but necessarily interdependent, things. The judgment «*śimṣapā* is a tree», or the inference «this is a tree, because it is a *śimṣapā*», contains three terms of which the one is the point of reality underlying the two others. There is between the two concepts also a kind of identity, an indirect identity or, as some of the European logicians have preferred to call it, a «partial identity»,<sup>2</sup> in that sense that they are not contradictory, not incompatible. A single reality could not possess at once two incompatible concepts. They are identical in so far they are not incompatible and belong to the same identical thing. The *śimṣapā* is necessarily a tree, it cannot be a non-tree, because

<sup>1</sup> *tādātmya-tadutpatti*.

<sup>2</sup> Sigwart, op. cit., I. 110 ff.

if it were not a tree, it would not be itself. We would have an object which would be at once a tree and a non-tree. If the qualities (or concepts) are incompatible, the reality of which they are, the qualities cannot be identical,<sup>1</sup> says the Buddhist law of Contradiction. It is a logical law between concepts, but it also is a law of reality.<sup>2</sup> Identity thus understood is as much a real relation<sup>3</sup> as Causality, it is the necessary corollary from Causality. In Identity the objective reference is one, in Causality it is double, but interdependent.

Now, what is the essence of the law of Causality? Its formula, we have seen, is «this being, that appears». It is a law of necessary dependence of every point-instant of reality upon its immediate antecedent point-instants; its expression is a Hypothetical Judgment. Since to every point-instant of reality corresponds some concept and the point-instant cannot be cognized otherwise than through a concept, there must be between the concepts corresponding to reality a logical relation similar to that real relation which obtains between the point-instants to which they correspond. Smoke is produced by fire, i. e., there is causal tie between a sequence of uninterrupted moments, a part of which is subsumed under the head of the concept of fire, and the following part of which is united under the concept of smoke. However the logical relation of these concepts is the reverse of the real relation between the corresponding points of reality. For logic means necessity and a cause is not necessarily followed by its result. Something can always appear which will prevent<sup>4</sup> the production of a given result. There is absolutely no causal judgment about the necessity of which one could be sure directly.<sup>5</sup> But the reverse relation is characterized by necessity. A result is necessarily the result of its cause, it could not exist if it were not a result and it could not be a result if it were not the necessary result of its cause. Therefore the logical law of Causation is really the law of the Effect. This is also the name which Dharmakīrti gives it.<sup>6</sup> He calls it inference «through the Effect».<sup>7</sup>

<sup>1</sup> *vīrrudha-dharma-saṃsargād (dharmā) nānā.*

<sup>2</sup> *astuni avastuni ca*, cp. NBT., p. 70. 22.

<sup>3</sup> Sigwart, op. cit., I. 442.

<sup>4</sup> *geḡ-byed-pa srid-pai-phyir = pratibandha-sambhavāt.*

<sup>5</sup> Sigwart, op. cit., I. 418.

<sup>6</sup> *kārya-anumāna = kāryeṇa anumāna.*

<sup>7</sup> Necessity between the very last moment of the cause and the first moment of the result is apparently also admitted, cp. NBT., p. 39. 72; transl., p. 88.

In this sense the logical law of Causation is the reverse of the real law of Causation. A cause is not a reason. The cause is not a sufficient reason for predicating (or predicting) the effect. But the effect is a sufficient reason for affirming apodictically the preceding existence of its cause. In this sense the law of Causation is also a law subaltern to the law of Contradiction in the same degree as the law of Identity. Every thing would not be a thing if it were not the result of some other thing.

It is therefore wrong to coordinate the law of Causation with the law of Contradiction. The latter is a universal law which equally governs all generalities or concepts and all realities or point-instants. But Causality governs the production of point-instants alone.

Sigwart thinks that it was a mistake on the part of Leibniz to coordinate the law of Contradiction and the law of Sufficient Reason as the only two great principles of all our arguments: For, according to him,<sup>1</sup> Leibnizens law of Sufficient Reason is nothing but the law of Causation and it was wrong to coordinate the logical law of Contradiction with the not logical, but real law of Causation.

Now, from Dharmakīrti's standpoint we have a law of Sufficient Reason which is the universal law of all our arguments and of which the two great principles of Identity and Causation are mere specifications. This law is called simply the Reason,<sup>2</sup> or the law of the Threefold Logical Mark.<sup>3</sup> Its formula, we have seen, is 1) in Subject presence wholly, 2) in Similar only, 3) in Dissimilar never. According to its two main figures the law is also called the Law of Position and Contraposition.<sup>4</sup> Its formula is this that the reason being posited its necessary consequence is likewise posited and in the absence of the necessary consequence the reason is likewise absent.

The Buddhist law of Causation, viewed as Dependent Origination, is expressed in a hypothetical judgment, «this being that appears». The Buddhist law of Sufficient Reason is likewise expressed in

<sup>1</sup> Op. cit., I. 254 — „Wenn ich den realen Grund einer tatsächlichen Wahrheit (*vérité de fait*) angebe, nenne ich die Ursache... Ebendaraus erhellt wie wenig Recht man hatte nun daraus ein schlechthin allgemeines logisches Gesetz zu machen, das neben dem Gesetze des Widerspruchs, inbetreff derselben Sätze gälte, welche auch unter dem Gesetze des Widerspruchs stehen, und in dem Leibniz'schen Satze einen logischen Grund zu suchen, der von der realen Ursache verschieden wäre“.

<sup>2</sup> *hetu = gtan-thsigs.*

<sup>3</sup> *trirūpa-linga = thsul-gsum-rtags.*

<sup>4</sup> *anvaya-vyatireka.*

a hypothetical judgment or a hypothetical Syllogism. The Position and the Contraposition<sup>1</sup> of this law corresponds to the *modus ponens* and *modus tollens* of the Mixed Hypothetical Syllogism. Since the universal law of Sufficient Reason is equally realized in deductions founded on Identity, as in those founded on Causation, we can maintain that all our arguments are founded on these two great principles and the syllogism of Causation exists in equal rights with the analytical syllogism.

The European syllogistic theory has never admitted causal deductions as a special variety of syllogism. The modern theory assumes that Causality, or the principle of Uniformity in nature, the principle namely that the same causes produce the same effects, is the fundamental principle of Induction and Induction is the opposite of Deduction or Syllogism. The latter are based on the principle of analytic Identity. Induction can never attain strict universality and necessity in its conclusions, whereas syllogistic deduction is characterized by necessity.

This was not the opinion of Aristotle. For him Induction was also a Syllogism and Causation was also founded upon the principle of analytic Identity. His causal Syllogism is a deduction of the effect from its cause. The cause is brought in line and identified with the middle term,<sup>2</sup> the effect occupies the place of the major term in the conclusion. But this deduction founded on Causality is not, as with the Buddhists, a second variety<sup>3</sup> coordinated with the analytic deduction of the particular from the universal; it is subordinated to it, or, on the contrary, the analytic deduction is subordinated to the causal one, since the Universal is regarded as a kind of cause. For Aristotle the cause is always the Universal of which the effect is the particular. The research of a cause of something is the research of a middle term.<sup>4</sup> The universal connection of cause and effect becomes known to us through induction from particular cases. All the four varieties of cause assumed by Aristotle are so many middle terms from which

<sup>1</sup> *anvaya-vyatireka*.

<sup>2</sup> Aristotle, it is true, also admits that often the effect is more notorious, so that we employ it as a middle term (cp. Grote, p. 223), and conclude from it to its reciprocating cause. But in this case the syllogism is supposed to be not causal, it is knowledge of the Ens, not of the *δύο*.

<sup>3</sup> However Aristotle also admits that the *quaesitum* is sometimes the Quiddity or essential nature of the thing itself and sometimes an extraneous fact (Analyt. Post., II, ii, a 31, cp. Grote, op. cit., p. 220). In this place Aristotle seems to admit that the two exclusive ultimate grounds for every inference are either Coherence (= Identity) or Causation (= dependence on an extraneous fact).

<sup>4</sup> Grote, op. cit., p. 240.

the effect, or the major, is deduced.<sup>1</sup> The essence of the cause is to produce its effect, just as the essence of a triangle is the cause, or the ground, for having its three angles equal to two right angles.<sup>2</sup>

The conception of Causality as an analytic relation was inherited from Aristotle by the schoolmen and by modern philosophy. It culminated in Spinoza's identification of *causa sive ratio*. Its result has been that the causal syllogism was ignored as a separate variety and neglected as a subordinate species, it did not exist at all. When the analytic theory of causation was destroyed by Hume psychologically and by Kant transcendently, the causal syllogism was nevertheless not acknowledged as a second variety having equal rights with the analytical. Hume denied the necessity and universality of all causal sequences, and Kant, although he established them upon a transcendental basis, identified them with the hypothetical judgment and left the categorical syllogistic form to analytic deductions exclusively.

In connection with Kant's deduction of the category of causation from the hypothetical judgment, it is interesting to note a theory for which Kant himself is not directly responsible, but which is a consequence of his deduction and which deserves to be mentioned in the light of its Indian parallel. According to this theory the relation of Coinherence is expressed in the categorical judgment, «all A is B»; but the relation of Causality is expressed in the hypothetical one «if there is A, there necessarily was B». This theory seems to admit that there are only two great principles upon which all our arguments are founded, the principle of Coinherence and the principle of Causality. It is then easily shown that the hypothetical form is equally applicable to both, it is not exclusively adapted to the causal relation.<sup>3</sup> The universal premise «*omne A est B*» really means that if something is A, it necessarily is B. The necessity of the relation is expressed by the hypothetical form<sup>4</sup> in this case, just as in the case of causation. The universal premise «A is always produced by B» means that «if there is A, there necessarily preceded some B». With these corrections and additions the theory would correspond to the Indian one. Indeed there is a general law controlling all our

<sup>1</sup> Ibid., p. 246.

<sup>2</sup> Ibid.

<sup>3</sup> Cp. Sigwart, op. cit., p. 297, cp. also Bain, Logic, I. 117; cp. J. S. Mill, Logic I, 92, he seems to have been the first to express the opinion that the hypothetical judgment does not differ very substantially from the categorical one.

<sup>4</sup> In sanscrit *yo yo dlūmavān sa so'gnimān*.



arguments. We can call it the law of the Reason or of the Sufficient Reason or, as the Buddhists call it, of the Threefold Logical Reason. It is expressed in the hypothetical judgment and means that, being given the reason the consequence necessarily follows, and if the necessary consequence is absent, the reason is also absent. Another name for this law is the law of Position and Contraposition.<sup>1</sup> It corresponds to the *modus ponens* and *modus tollens* of the Mixed Hypothetical Syllogism. Its canon of rules consists of these three—in subject presence wholly, in similars only, in dissimilars never. This corresponds to the principle *nota notae est nota rei ipsius* and to the *dictum de omni*.<sup>2</sup> It is equally applicable to both the “great principles” upon which all our arguments are founded, the principle of Identity and the principle of Causation. Indeed, take the Indian type-instance—

If something is a product, it is not eternal, as a jar etc.

If it is eternal, it never is a product, like Space etc.

The sounds are products.

They are not eternal.

Or take the corresponding European type-instance—

If some being is a man, he necessarily is mortal, as this one and that one,

If he is immortal, he cannot be a man, like God.

This one is a man,

He is mortal.

The mathematical deductions reduce to the same form, e. g.,

If something is a straight line, it necessarily is the shortest distance between two points, as this and that straight lines.

If it is not the shortest distance, it is not straight, as the curve etc.

This is a straight line,

It is the shortest distance.

These deductions do not differ in form from the causal one. Indeed, take the Indian type-instance<sup>3</sup>—

Wheresoever there is smoke, there is fire, as in the kitchen etc.

<sup>1</sup> *anvaya-vyatireka*.

<sup>2</sup> That these both formulas are the same, has been proved by Kant, cp. *Von der falschen Spitzfindigkeit*.

<sup>3</sup> The hypothetical character of this judgment is expressed in Sanscrit by the words *yatra yatra dhūmah* or *yo yo dhūmavān*, this corresponds to the latin *quis quis*, cp. Sigwart, I. 288.

Where there never is fire, there can be no smoke, as in water etc.

There is here smoke.

There is also (or there was) fire.

No formal difference exists between the two sets of instances. Both come under the head of the law of Position and Contraposition or of the threefold logical mark, or of the two moods of the Hypothetical Syllogism.<sup>1</sup> The difference consists only in this, that universality of the causal sequence is not the same as the universality and necessity of a connection founded on Identity. What the Indian solution of this problem is and how far it coincides with the Kantian one has been mentioned in the chapter on Inference.

#### h) Summary.

In summarizing our comparison of the European, chiefly Greek, and the Indian, chiefly Buddhist, system we find.

1. There is in the human intellect a fundamental procedure constituting its very essence, with the investigation of which both the Greek and the Indian science have busied themselves, with a view to a clear definition of its substance and forms. This procedure is Inference or Syllogism. Inference for Buddhists is the same as thought in general, since there are only two sources of knowledge, sensation and inference, the same as the senses and the understanding.

2. On both sides the investigation is conditioned by the general philosophic outlook. The Greek philosopher surveys the world as an ordered system of realized concepts whose total and partial connections and disconnections are laid down in Syllogisms. The Indian philosopher surveys the world as a running stream of point-instants out of which some points are illuminated by stabilized concepts and reached by the striving humanity in their purposive actions.

3. The Greek science defines syllogism as a series of three propositions containing together three terms and capable of yielding 19 different moods of valid judgments according to a change of the grammatical position of these terms in these propositions. The Indian science defines it as a method of cognizing and reaching reality, not directly as in sense-perception, but indirectly

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<sup>1</sup> The importance given to of the Hypothetical Syllogism is also an outstanding feature of the logic of the Stoics, cp. Paul Barth, *Die Stoa*<sup>3</sup>, p. 74.

through a superstructure of two necessarily interdependent concepts.

4. The fact that Syllogism contains an internal process of inferential cognition is not unknown in European science, but it is treated as an imperfect and incomplete form of what is fully expressed by the formulation in three propositions with an interchangeable position of their subjects and predicates. The Indian Syllogism, on the contrary, being subservient to internal Inference, is a method of formulating in propositions the mutual necessary interdependence of the three terms which therefore have a logically fixed position in corresponding propositions.

5. Although in Aristotle's intention Syllogism is the general form of all Deductions as well as Inductions, it became in the hands of his followers restricted to Deduction alone, and as soon as Induction raised its head in modern times, the position of the Syllogism, restricted to mere deductions, became endangered. By many philosophers it is declared to represent futile scholasticism worthless for the progress of knowledge. On the Indian side Deduction is inseparable from Induction, they mutually contain each the other, the one is the justification of the other. Deduction not preceded by Induction is impossible. Even purely deductive sciences have an inductive foundation like the rest. On the other hand Induction without an application to further particular instances would be quite worthless.

6. There is therefore in the Buddhist Syllogism only two members, an Inductive one and a Deductive one, which correspond to a grounding and an applying march of thought.

7. The Buddhist System contains a Causal Syllogism which in European logic was at first merged in the analytical one and later excluded from the domain of syllogism altogether.

8. The Buddhist System coordinates Causation and Identity (Coinherence) as the two great principles upon which all our arguments and their expression, the syllogisms, are founded.

9. The formal unity of these two great principles is expressed in a Universal law of Sufficient Reason or, as it is called, the Threefold Reason.

In European science the problems of a law of Sufficient Reason, of the analytic and causal relations and the allied problem of the analytic and synthetic judgments are mostly treated outside the theory of syllogism. In India they are its integral parts. The Intellect is but another name for Reason and the Reason is nothing but the Sufficient Reason or the principle representing the formal unity of the two great

principles of Identity and Causality. There is no difference between Reason in general and the Syllogistic Reason with its canon of threerules.

10. The second and third of these rules correspond to the *modus ponens* and *modus tollens* of the Mixed Hypothetical Syllogism. There is therefore only two real syllogistic figures, the positive and the contraposed one. The fundamental principle of all Syllogism is the principle of the Mixed Hypothetical Syllogism, the principle namely that «the ground is followed by the necessary consequence and the denial of the necessary consequence is logically followed by the denial of the ground».

11. The law of Sufficient Reason, since it is expressed in the canon of the three syllogistic rules is also expressed in the equipollent principle of the Mixed Hypothetical Syllogism, or in Position and Contraposition. They express the law of logical necessity. The Mixed Hypothetical Syllogism, which in the majority of European logics is treated as an additional, secondary, not genuine syllogistic process, appears in Buddhist logic as its fundamental principle.

There is thus a great difference between the European and the Buddhist syllogistic theory. However both theories are groping after one and the same central problem, the problem, namely, of the principles of human knowledge. The solution proposed by Dignāga and Dharmakīrti is, in some respects, nearer to Kant and Sigwart, than to Aristotle.

The opinion of Kant upon the «False Subtlety» of the Aristotelian figures has already been mentioned. But this is not the only point of agreement between the Kantian and the Buddhist theory. The following Kantian ideas must in this connection attract our attention. «To compare a thing with its mark, says Kant, is to judge». «A judgment through an intermediate mark (i. e., through the mark of the mark) is our reason's inference (*Vernunft-schluss*)». He then calls attention to the principle of Contraposition and gives to those Syllogisms where the conclusion is arrived at through Position and Contraposition of the major the name of *ratrocinium hybridum*.<sup>1</sup> He then identifies the syllogism of Position with the first Aristotelian figure and the syllogism of Contraposition with its second figure, declaring the rest to be useless and false subtlety. By giving such importance to the fact of Position and Contraposition Kant has virtually (although he does not state it

<sup>1</sup> Cp. *anvaya-vyatireki anumānam*.

expressly) admitted that syllogism is founded upon the principle of the Mixed Hypothetical Syllogism with its two moods, the *modus ponens* and the *modus tollens*. Kant says that although the four figures are nothing but useless rubbish (*Plunder*), he has no hope to overthrow at once the colossus of Aristotelian syllogistic. Indeed Sigwart, for aught I know, was the only logician who has taken up Kant's suggestions and established his syllogistic theory on the principle of the Mixed Hypothetical Syllogism.

Indeed Sigwart maintains<sup>1</sup> that «the most general form of all and every inference is the so called Mixed Hypothetical Conclusion». «When a valid judgment A is given, it is clear that another judgment X can be founded on it only if the unconditional and universal proposition be admitted that „if A is valid, X is also valid“.<sup>2</sup> «The order of the premises, he continues, depends on the movement of thought in every individual case».<sup>3</sup> This corresponds to Dignāga's view that in private thinking we usually begin with the minor premise and in a public debate we must begin by the universal proposition.

«All kinds of deduction of a simple statement, he then says, must be traceable to the two forms which usually are called the *modus ponens* and the *modus tollens* of the Mixed Hypothetical Conclusion». «The *modus tollens*, he adds in a note, is always reducible to a corresponding *modus ponens*». He thus maintains the equipollency of both these moods, thus siding, as it were, with Dignāga against the Sāṅkhyas.

He then makes a remark which receives a particular interest from the standpoint of a parallelism with Indian theories.<sup>4</sup> «A further development of the theory of Inference, says he, should touch on the problem, what is it then that makes the connection between two judgments A and X a necessary connection? Whether it is not possible to trace this necessity back to a limited small number of laws?» This question is only suggested, no definite answer is given, although the interesting remark is passed that «Identity is also a relation between thoughts». Now the other relation of necessary dependence, we have seen, is non-Identity between two interdependent facts, and *dependent non-identity* is nothing but another word for Causation. There is, according to the Indians, from this point of view, no other relation

<sup>1</sup> Op. cit., I. 434.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid., p. 442.

than Causality (between two facts of necessary consecution), and Identity (in the objective reference of two concepts).

The laws upon which all necessary connection reposes, we have seen, are those of Identity, Causality and Contradiction, in their Indian interpretation.

The views expressed by Sigwart in this connection on Conversion, Contraposition and the particular judgments are notorious by their parallelism with some Indian conceptions. They have already been quoted above.