The aim of induction is to establish necessary synthetic propositions. The Buddhist Logicians hold that a necessary synthetic proposition can be established on the basis of the knowledge of causal relation between two phenomena. Thus, according to them the aim of induction is to discover the causal relation between two phenomena.

Before trying to understand how the causal relation between the two phenomena is established, the nature of causal relation must be noted. An effect is related to its cause that whenever the former occurs, the latter must occur and whenever the latter does not occur, the former must not occur, notwithstanding the occurrence of anything else. To say that 'X is the cause of Y' means that Y occurs only when X occurs, i.e. it never occurs when X does not occur.

From the above analysis of the nature of causal relation, the following canon follows regarding the method of its determination: A thing in the absence of which an event occurs cannot be the cause of that event. It is a negative canon, but it is the basis of determining the cause of an event. A person observes repeatedly that when a particular event occurs, certain other events A B C Y also occur. According to the canon mentioned above it is clear that anything, which is absent when X occurs, cannot be its cause. Now, if the observation shows that there is nothing but A B C Y, when X occurs, the cause of X must be sought among them. Either all the four together or any two or three together or any one singularly is the cause of X. If any one of them is eliminated without in any way affecting the occurrence of X, it cannot

* Compare Joseph, An Introduction to Logic, P.429. The cause of any effect in the strictest sense of that relation is so related to it, as to occur whenever the effect occurs, and never when it does not, and to vary or be constant as the effect varies or is constant, when susceptible of variations in quantity or degree.
be regarded as its cause. Suppose, when A is eliminated, B C Y are kept constant, 
X does not cease to occur. It proves that A is not the cause of X. But 
when B is eliminated and others are kept constant, X ceases to occur. It proves 
that B is the cause of X or at least the necessary condition for the occurrence 
of X, because when B is eliminated, X ceases to occur.

The statement that 'wherever there is smoke, there is fire' expresses 
that the smoke is the effect of fire. Unless we hold that smoke is the effect 
of fire, we cannot assert with certainty that whenever there is smoke, there 
is fire. But when it is held that smoke is the effect of fire, it cannot be 
denied that whenever there is smoke, there is fire. The fire is to be regarded 
as the cause or at least a necessary condition of fire because smoke cannot 
be produced in its absence. There is nothing which can give rise to smoke in 
the absence of fire. We can deny that fire is the cause of smoke, only when 
smoke can be produced in the absence of fire. But the fact is not so. We 
observe that smoke arises only in that situation in which there is fire. 
Besides fire there may be other things such as an ass, a pot, piece of 
fire, etc. in the situation in which smoke is produced, When the ass, 
which is present in the situation in which smoke is observed, is removed, 
we see that the smoke does not cease to occur. So is the case, when other 
things such as the pieces of furniture etc. are removed. All this proves that 
none of them is the cause or a necessary condition of smoke because the smoke 
continues to rise even in the absence of these things.

Now, if smoke is to occur in the absence of fire, the latter cannot 
be regarded as the cause of the former. The occurrence of the former, then, 
should be completely independent of the occurrence of the latter. But this is 
not the fact. The fact is just the reverse, When we eliminate fire from the 
situation in which smoke is rising, the smoke ceases to rise. Whenever there
is an effect, there must also be its cause. A particular thing is regarded as the cause of another, because whenever the latter occurs, the former must occur. The nature of an effect is also such that whenever it occurs, its cause must also occur. Such is the nature of smoke in relation to fire. Mere observation of smoke along with fire, does not prove that smoke is the effect of fire. But the observation of smoke along with fire suggests that smoke may be the effect of fire. However, this hypothesis that smoke may be the effect of fire is to be proved. This can be proved by showing that the smoke cannot be produced in the absence of fire.

When it is proved that smoke is the cause of fire, we can generalise that wherever there is smoke, there is fire. The necessary presence of fire with smoke is proved by the non-occurrence of smoke in the absence of fire.

If the presence of fire were not necessary for the occurrence of smoke, why should the latter not occur in the absence of the former? As smoke does not occur in the absence of fire, it is established that smoke is the effect of fire. Therefore, it is certain that wherever there is smoke, there is fire.

If the observation of smoke occurring along with fire does not suggest that it is the effect of fire then, it can never be established that wherever there is smoke there is fire. Without accepting the relation of necessary dependence of smoke on fire, it cannot be asserted that wherever there is smoke there is fire. The invariability of concomitance of one phenomenon with another can be asserted only if it is accepted that one phenomenon is necessarily dependent upon the other.

Again, if it is not first accepted that smoke is the effect of fire, mere non-observation of smoke in the absence of fire does not prove that wherever fire is non-existent, smoke is also non-existent. Such a generalisation regarding the concomitance of the absence of smoke along with the absence of fire is possible if it is, first accepted that wherever there is smoke there
must be fire which is possible only when smoke is regarded as the effect of fire. Mere non-observation of smoke in the absence of fire does not establish anything more than the smoke does not exist at the places where fire is not observed. Mere observation of a few instances, positive or negative, is not the sufficient basis for making generalisations regarding them. It should be noted that observation of two phenomena together merely suggests the hypothesis of the relation of necessary dependence of one upon the other. The cases of concomitance observed may be the instances of such relation. On the basis of the hypothesis of the relation of necessary dependence of one upon the other, it is possible to generalise their concomitance. The causal relation which is first accepted as a sort of hypothesis regarding two phenomena can be proved by the method of difference.

We can put the Buddhist method of inductive inquiry more clearly in the following way:

1. First, two phenomena are observed together repeatedly.
2. Secondly, the observation of the occurrence of two phenomena together suggests the hypothesis that one of them is necessarily dependent upon the other. The relation of necessary dependence of one phenomenon upon the other is the relation of causation.
3. Thirdly, the hypothesis of causation leads to the generalisation of the concomitance observed in some instances only. The inductive reasoning which leads to the generalisation can be stated as follows:

   A and B are repeatedly observed together. Therefore, A probably is the effect of B. As A is the effect of B, therefore, wherever there is A, there must be B as an effect cannot occur without its cause.

   But it is yet to be proved that A is the effect of B. The Buddhists hold that this can be proved by the method of difference which is based on the canon that anything in the absence of which a phenomenon occurs cannot be its cause. The hypothesis which is to be proved is that A is the effect of B.

   This hypothesis can be proved to be false only by showing that A occurs even in the absence of B. In order to determine if A occurs in the absence of B or not, an experiment is to be performed. Suppose, in a particular
situation: A and B occur along with certain other things. We eliminate B keeping all things else constant. Now, if we observe that A continues to occur even after B has been eliminated, then it is proved that the occurrence of A is not dependent on the occurrence of B i.e. A is not the effect of B. But if A ceases to occur, when B is eliminated keeping other conditions constant, then it is proved that A necessarily depends on B because it cannot be produced in the absence of B.

The Buddhists emphatically assert that if the generalisation is not based on the hypothesis of some relation of necessary dependence of one phenomenon on another, it can never be proved to be valid, simply on the basis of observation and non-observation of the two phenomena together. The universality of the concomitance of one phenomenon with another can be asserted with certainty by showing that one phenomenon is necessarily tied (pratibaddha) with the other. The necessary dependence of one phenomenon on another can be conceived only in the form of a causal relation.

The realist Logicians argue that no logical purpose is served by holding that the invariable concomitance of a ‘śādhyā’ with a ‘hetu’ is based either on the relation of Causation (tadutpatti) or the relation of identity (tādālmya) between the things denoted by them. Whether a particular phenomenon is the effect of another phenomenon or not cannot be proved by any ‘a priori’ method. It can be proved by the ‘a posteriori’ method viz. the method of observation and non-observation only. If the law of invariable concomitance between two phenomena cannot be established by the method of observation and non-observation beyond the possibility of doubt, then the relation of cause and effect between two phenomena also cannot be established by this method.

It is suggested that the law of invariable concomitance of one phenomenon with another can be proved by the following method without assuming the relation of causation or identity between them.
The smoke is observed along with fire repeatedly in many cases. The repeated observation of smoke along with fire would not be possible, if there were no law of invariable concomitance of smoke with fire. This law would be contradicted only if smoke were observed in the absence of fire. But smoke has never been observed in the absence of fire. Therefore, smoke is invariably concomitant with fire.

The Buddhists point out that the above reasoning is defective. How can the non-observation of smoke in the absence of fire prove that the former is invariably concomitant with the latter? The non-observation of a particular thing at a particular place proves nothing more than that the thing does not exist there. The non-observation of smoke in the absence of fire till today does not preclude all the possibilities of the observation of smoke in the absence of fire in future.

The non-observation of smoke in the absence of fire can prove the invariable concomitance of the former with the latter only if the former is regarded as the effect of the latter. The smoke will invariably be concomitant with fire because the former can never arise in the absence of the latter. Smoke can never arise in the absence of fire because the former is the effect of the latter. An effect can never arise without its cause.

The Buddhists hold that the inductive method involves five steps. First step, Non-observation of a particular phenomenon in a particular situation; Second step, Arranging certain conditions in that situation; Third step, Observing a new phenomenon which was not observed before the conditions were arranged; Fourth step, The elimination of one condition keeping other conditions constant; Fifth step, Non-observation of the phenomenon which was observed when the condition was not eliminated.
Let us take a symbolic example. We observe ABC but not X in a particular situation. The conditions L M are introduced in the situation. Then, we observe X in that situation. L is eliminated from that situation, X ceases to occur when L is eliminated. Thus, it is proved that X is the effect of L.

II

A DISCUSSION BETWEEN THE BUDDHIST AND THE NAIYĀYIKAS ON 'THE DISCOVERY OF CAUSAL RELATION AS THE AIM OF INDUCTION'

Vācāspati Mīśra criticises the Buddhist's inductive method in the following way. The Buddhists maintain that the invariable concomitance of fire with smoke can be proved by proving that the latter is the effect of the former. The Naiyāyika asks: what is the relation of an effect to its cause? Does it mean the occurrence of the effect after the cause? If it were so, then an ass would also be regarded as the cause of smoke, as the existence of an ass precedes the occurrence of smoke in several instances. It may be urged by the Buddhists that a phenomenon can be regarded as an effect of another phenomenon, if the former occurs only when the latter occurs. It is true that the occurrence of smoke is preceded by the occurrence of an ass in some cases. But it occurs even in the absence of an ass and does not occur in its presence when there is no fire in the situation. Even, when there is no ass in the situation, the smoke occurs in the presence of green fuel fire. The Naiyāyika points out that all this proves nothing more than that the smoke occurs along with fire in those cases in which it has been observed and does not prove that in the unknown places, the occurrence of smoke necessarily depends upon the occurrence of fire. We observe the occurrence of smoke in the presence of an ass and do not perceive the former many a times in the absence of the latter. But does it prove that the smoke is an effect of an ass? Similarly, the observation of smoke in the presence of fire and the non-observation of the former in the absence of the latter does not conclusively prove that the
former depends necessarily on the latter for its occurrence. It may be possible that the presence of fire in those cases in which smoke is observed may be nothing but an coincidence and the real cause of smoke may be some invisible demon. Therefore, the possibility of observing smoke in the absence of fire in future cannot be completely ruled out as it is quite probable, as suggested above, that the cause of smoke may be some invisible demon, and not fire. To argue that when it is proved that smoke arises following fire and never in its absence, there remains no scope of the doubt that it is caused by demon, would amount to begging the question.

The Buddhist argues that the occurrence of smoke is observed only when fire occurs with wet fuel. A demon is never perceived preceding the observation of the occurrence of smoke. It is quite obvious that there must be some cause of smoke, for without accepting that its occurrence depends upon something else, its contingent character cannot be explained. Only that which is invariably observed preceding an event can be its cause. An ass is not invariably observed preceding the occurrence of smoke. In certain instances, smoke is also observed in the absence of an ass. Therefore, the ass cannot be the cause of smoke. Nor can a thing which is never observed preceding an event can be regarded as its cause. A demon is never observed preceding smoke. Therefore, it cannot be regarded as the cause of smoke. But smoke is invariably observed along with the fire with wet fuel and never observed in its absence. Then, why should fire not be regarded like the wet-fuel as the cause of smoke?

Now, if fire is regarded as the cause of smoke, does there still remain any doubt regarding the occurrence of smoke in the absence of fire? An effect cannot arise without a cause. And there is nothing which is not an effect of some cause. Anything which is not caused by something else must either be eternal or completely non-existent. It cannot be contingent.
Nor can a thing be produced by more than one cause because to hold so would amount to holding that it arises without a cause. It cannot be held that in some cases fire may arise following something which is not fire as it is caused by fire. Thus, to hold that smoke is produced without fire would mean that it is produced without a cause.

To hold that smoke arises without a cause would contradict its contingent nature. Thus, to prove that smoke is caused by fire means nothing more than to prove that smoke arises always in the presence of fire and never in its absence.

The Naiyāyika urges that all this is plausible. We can accept that the occurrence of smoke is necessarily preceded by fire, when it is proved that the fire is the causal condition of smoke. But that fire is the necessary causal condition of smoke cannot be proved. It is true that the smoke is never observed in the absence of fire. It is also true that no demon has ever been observed preceding the observation of smoke. But, still, one may think that the occurrence of smoke is the effect of some invisible demon and that the occurrence of fire preceding all the observed instances of smoke is nothing but an accident which is brought in by its own causal conditions. Just as an ass is observed preceding the observation of smoke, but is not regarded as the causal condition of smoke, similarly, the fire which is observed preceding all the observed instances of smoke cannot be regarded as its cause. Thus, there remains the probability of the occurrence of smoke in the absence of fire. The smoke may be caused by something other than fire. This probability of the occurrence of smoke in the absence of fire cannot be denied.

The Buddhist may urge that when an event can be explained by regarding some of its known antecedents as its cause, it would be farfetched imagination to hold that it is caused by some unknown antecedent. The
Naiyāyika points out that the above reasoning of the Buddhist is not correct. More non-observation of a particular thing in a particular situation does not prove its non-existence. Man has limited power of observation. It is quite possible that something may be lying hidden in a particular situation which we are observing and this hidden fact, be the cause of the phenomenon which we are trying to explain.

Thus, it cannot be established that smoke occurs depending necessarily on fire. Unless it is established that smoke occurs depending necessarily on fire, it cannot be held that the fire is the cause of smoke.

While refuting the doctrine of plurality of causes the Buddhists have urged that there arises a change in the quality of the consequent along with the change in the nature of its antecedents.

The Naiyāyika points out that this is not correct. The quality of smoke which arises in a situation in which there exists fire along with an ass is the same as the quality of the smoke which arises in the situation in which there is fire but from which the ass is absent. Thus, there will always remain doubt regarding what has been regarded as the cause of phenomenon.

Vācaspati thinks that there is no contradiction between the law of causation and the doctrine of plurality of causation. The possibility of the existence of more than one cause of a phenomenon will always vitiate our generalisation which is formed regarding the invariability of a cause of a phenomenon. Therefore, the law of causation should not be regarded as the essential ground of inductive inquiry. The inductive inquiry should be based upon the uniformity of nature. The uniformity of nature is not essentially the uniformity of causation. Nor does the uniformity of succession necessarily follow from the causal relation between two phenomena.

While the Buddhists hold that the law of causation is the basic postulate of induction and the law of uniformity of succession is necessarily
implied therein, the Naiyāyika regards the law of uniformity as the

ground of induction and rejects the Buddhists contention that the uniformity
of succession is implied in the causal relation. The uniformity of con-
comitance of one phenomena with another does not follow from their causal
relation. However, it follows from their being naturally*. It may be the
uniformity of co-existence, co-occurrence, co-inherence, succession or of
any other kind. The uniformity of concomitance between two events does
not follow from their causal relation. But it necessarily follows from
the natural or unconditional concomitance between them. Therefore, instead
of waiting energy to determine causal relation between two phenomena,

attempts should be made to determine if the concomitance of one phenomenon
with the other is natural or accidental. How this can be determined will
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be shown in the sequel.

There is another difficulty in holding the relation of cause and
effect between the property to be inferred (sādhyā-dharma) and the reason
(hetu). To hold that a cause is inferred from its effect would mean that what
is inferred is something which belonged to the past and is non-existent
at the time of inference. Naturally, such an inference does not serve any
practical purpose. It cannot guide man to realise what is existent in

the present but is not given to the senses.

In reply to this, the Buddhist says that it is true that cause does
not continue to exist along with its effect. The origin of an effect is
synchroneneous with the death of its cause. But the series of moments of one
kind is so related to series of the moments of another kind that each moment
of one series is the cause or the effect of some moment of the second
series. This is what actually happens when smoke is causally related to

fire.
Each new moment of smoke is causally dependent upon a new moment of fire. We fail to observe the difference between one moment of fire and the other moment of fire and similarly between one moment of smoke and another moment of smoke. We observe smoke as one phenomenon rising from the ground. It should be noted that the smoke as such does not serve as the reason for the inference of fire. The smoke which is confined to a jar or to a room does not lead to the inference of fire.

The smoke which is continuously rising upward from the ground serves as the reason for inferring fire. A person who follows this inferential knowledge, can obtain fire as the series of the moments of fire which are continuously rising and dying along with the rise and death of the moments of smoke.

It should be remembered that according to the Buddhist theory of causation and momentariness, a moment of smoke, which arises after a moment of smoke and a moment of fire, is objectively as much disconnected from the moment of smoke as from the moment of fire. But owing to the similarity of a moment of smoke to the preceding moment of smoke, the difference between them is not grasped and every succeeding moment of smoke is taken for the continuity of the preceding one. Neither the origin of the second moment nor the extinction of the first moment is observed by the human mind. Thus, though there is causal relation of one moment of smoke with the preceding moment of smoke yet this relation between them is not grasped by human mind and the uninterrupted origin of a new moment of smoke following the death of the preceding moment of smoke is taken for the continuity of one durable object, the smoke. Similarly, the difference between one moment of fire and the other succeeding moment of fire is not observed and continuous origin and death of the moments of fire are taken for
the enduring object - the fire. But the difference between the moments of fire and the moments of smoke is observed. Thus, the cognition that smoke is the effect of fire is obtained by means of determinate perception which, according to the Buddhist, is a thought-construct arising after indeterminate perception.

Keeping in view the Buddhist theory of causation, another objection may be raised against the Buddhist's method of induction. The Buddhists hold that the process of the establishment of causal relation between smoke and fire has three stages:

1. First state: The observation of smoke along with fire in several instances.
2. The state of formation of the hypothesis that fire is the cause of smoke.
3. Third state: Testing the hypothesis.

In order to realise that the smoke is the effect of the fire it is necessary that both the smoke and the fire become the objects of the same cognition. If the cognition of smoke is different from the cognition of fire, how would we ever form this concept that one is the cause of the other? Thus, though there may be causal relation between the smoke and the fire, yet as they belong to different moments, they cannot be comprehended by the same cognition. The indeterminate perception of the preceding moment does not grasp the succeeding moments. Thus, it is not known by the indeterminate perception of the preceding moment of fire that it is the cause of the succeeding moment of smoke, as the indeterminate perception of the preceding moment cannot grasp the succeeding moment which is as yet unborn. The indeterminate perception of the succeeding moment cognise that every moment and not its preceding moment. Therefore, it cannot cognise that the moment which is perceived is the effect of the preceding moment, as by the moment of the origin of the cognition of the succeeding moment, the preceding moment becomes completely extinct. The causal relation between a succeeding
moment and its preceding moment cannot be known even by the determinate perception. The above reasoning applies with regard to the determinate perception also. Thus, it can never be established that an event is the effect of another event. As the causal relation is never experienced, its recall or recognition also is not possible.

The Buddhist replies that there is no causal relation in the objective world. There is no connection between one moment and the other. That one is the cause of the other is simply the superimposition of thought.

To be an effect means to arise after what is known as its cause. To be a cause means nothing but to be an antecedent of what is known as its effect. To arise before or after an event is not something different from the event which so arises. At a particular moment we perceive that an event, A, occurs. Next moment, we perceive that another event, B, occurs. We perceive nothing but the occurrence of A in the first instance and that of B in the second instance. That A occurs before B is apprehended by perception. Similarly that B arises after A is also known by perception. That A is the cause of B means nothing more than the occurrence of the former invariably before the latter. Similarly B's being effect is nothing more than its occurring after A. How can then it be said that it is through perception that we realise that B is the effect of A? It is in perceiving the succeeding event that we say that it is the effect of what was perceived preceding it.

An event which is regarded as the cause of another event. To hold that being cause of B is identical with the event which preceded it would involve contradiction. On the one hand we say that 'A is 'the cause of 'B', on the other we maintain that 'being cause of B' is identical with A. Can we hold both these statements without involving contradiction? Can we hold that the predicate of a synthetic proposition (As t is the case of B) is identical with its subject without involving contradiction? Being cause
of $B$ cannot also be something different from $A$, which is regarded as its cause. There is nothing in $A$ over and above its being an event. If 'being cause of $B$', and being an event denoted by $A$ were objectively two things, then $A$ as such would not be the cause of $B$. Thus, in the objective world, there is nothing as 'cause' or as 'effect'. In the objective world, only the events occur, one following the other. Stcherbatsky quotes Dharmakirti as follows:-

"Since cause and its effect do not exist at once, how can, then their relation be existent? If it exists in both, how is it real? If it does not exist in both, how is it a relation?"

We regard the immediate antecedent of an event as its cause and its immediate consequent as its effect. But to regard one event as cause and the other as effect is to superimpose upon them the 'a priori' concepts of 'cause' and effect. In the objective world, events arise in the form of precession, one following the other. An event which precedes is the cause of what succeeds. It is by means of perception that we cognise an event as preceding another event. Thus, both the preceding and the succeeding events are cognised by means of perception. As the cognition that an event, $A$ precedes another event, $B$, is obtained by means of perception, it can also be recollected.

The opponent of the Buddhists further points out that the causal relation between two moments cannot be realised as the moments are too subtle to be the object of cognition. It is also not correct to say that the causal relation is realised between two series of two different kinds of moments, as the series has no objective reality over and above the moments. The discrete moments devoid of all intelligible characteristics alone are real. They are too minute and evanescent to be cognised as concrete objects. Thus, the causal relation between them cannot be realised, and there is no such
thing as the series of moments regarding which we can talk of causal relation.

In reply to this objection against his theory, the Buddhist further explains his theory. A real thing is atomic in nature and is physically disconnected from every thing else in the universe. The objects having duration and extension are not objectively real. The moments of the same kind which arise continuously in close succession are taken for the continuous existence of one identical object by the human intellect, as it fails to grasp the difference between the moments. Thus, the moments which are of the same kind and which arise continuously in close succession are not discriminated from one another and the causal relation between one moment and the other of the same kind is not grasped.

But the difference between two different series is observed. Thus, it is apprehended by means of perception that one series is causally related to the other series. First, the series of the moments of fire is observed. The series of the moments of fire is not a new entity over and above the discrete moments of fire. But as all these moments are similar in kind, their mutual differences are not apprehended by the human thought and, consequently, the idea of oneness is superimposed upon them. Thus, we think that we perceive concrete fire having extension and duration. The process of perceiving smoke as a concrete object having extension and duration is also the same. Though owing to the similarity between one moment and the other, the causal relation between the moments falling within the same series is not grasped, yet it is known by perception that one event is consequent to another event. Thus, it is by determinate perception (the judgement which arises following the indeterminate perception) that we cognise the causal relation of one series to the other.
Thus, there is nothing in the objective world, which correspond to the concepts of cause and effect. The unique particulars (Svalaksanas) are real. The concepts of cause and effect are superimposed upon them by the understanding.

The fire which really precedes the smoke is a 'particular' fire. It is a moment of fire. Similarly, what succeeds the fire is the 'particular' 'smoke', it is a moment of smoke. But what is regarded as the cause of smoke is not some 'particular' fire. It is the concept of fire. Similarly, what is regarded as the effect of fire is not some particular smoke but the concept of smoke. In the objective reality there is the procession of the disconnected, evanescent unique-particulars. There is no universal in the reality.

The Naiyayika now, contends that in the absence of the reality of the 'universals' how can we have the general concept of fire and the general concept of smoke? And in the absence of the knowledge of causal relation between fire in general and smoke in general how can we say that the concept of smoke is inferred from the concept of fire?

The Buddhist explains his position pointing out that what, in reality, occur as antecedent and consequent are the unique-particulars. But human thought is incapable of cognising the unique particulars. A unique particular is grasped by indeterminate perception only. The indeterminate perception of a unique particular is followed by a judgment which consists of the predication of a general concept of the reality, the 'unique particular'. But what is this general concept? And how can we have a general concept if there is no universal in the objective world.

The Buddhist replies that a 'universal' is not a real entity over and above the particulars. It is a more thought which is negative in essence. The general term fire does not mean 'universal essence of fire'. It
means nothing but the negative of non-fire. Thus, to grasp the relation between two general concepts nothing but to superimpose a relation on the unique particulars.