An Introduction to Jnanastatics

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Abstract

The word Jnanastatics is derived from the Sanskrit word ‘jnana’. In Indian philosophy, the word jnana means knowledge. Knowledge is knowing the object exactly as it is. Just as the lamp illuminates everything in front of it, so does knowledge that reveals to us everything in front of it. Here the theory of knowledge of the East and the West has been combined. This paper discusses elaborately the methods of gaining knowledge, the origin of knowledge and the nature of the known object. Argumentism about the method of gaining knowledge, cognitism about the origin of knowledge and relativism about the nature of the known object, these three new theories have been introduced. Knowledge is a theory or tattva and in order to get knowledge of an object one needs to know the form or akara and component or upakarana of that theory. These theory, form and component, which are essential for the discussion of knowledge, have been properly discussed in this paper. Category and its classification of substance, quality, action and adjustment have been properly discussed. Adjustment is a new addition to the classification of substances. The forms of knowledge and their components are discussed in detail.

Keywords

Knowledge, Category, Assertion, Dimension, Quantity.

Article Outline

1. Introduction

This paper is basically a combination of Eastern and Western knowledge theories. A new knowledge theory has been introduced by combining Eastern and Western knowledge theories. In fact this material world is true. The problem is that we tell the truth as much as we know and we tell false as much as we do not know. The matter is relative.

It has to be achieved. Generancy epistemology is discussed in two parts and these two parts are external and internal parts. The external part discusses the methods of gaining knowledge, the origin of knowledge and the nature of the known object. The internal part discusses the four forms of knowledge and their components. All topics are discussed with the help of mathematics.

2. Knowledge

Knowledge or jnana is the manifestation of objects. Knowledge is to convey the object as it is. Just as everything is seen when light falls in the darkness, so also the material world is revealed to us in knowledge. Knowledge is the only way to understand something unknown. Knowledge is self-evident.

There are mainly two types of knowledge, namely prama (valid knowledge) and aprama (non-valid knowledge). The characteristic of valid knowledge (prama) is the similarity, uniformity, adequacy and consistency to the nature of its object. Otherwise the knowledge is non-valid (aprama). Any valid knowledge requires three conditions, namely, pramata (the subject), prameya (the object) and pramana (the source of knowledge). Pramata acquires the valid knowledge of objects with the help of pramanas. Pramata is the jnata, one who knows. Prameya is the jneya, that is the knowledge of that object is acquired. Pramanas is the valid source of knowledge that is with the help of which the right knowledge can be obtained.

There are four types of pramanas of valid knowledge, namely, pratyaksan, anumiti, upamiti and sabdaboda. Again, there are four types of non-valid knowledge, namely, smrti (memory), samsaya (doubt), bhrama (error) and tarka (hypothetical argument). In all valid knowledge there are three factors, namely, pramata (the subject), prameya (the object) and pramana (the source of knowledge). Pramanas are of four kinds, namely, pratyaksa (perception), anumana (inference), upamana (comparison) and sabda (testimony).

The following figure explains how to gain knowledge of an object.

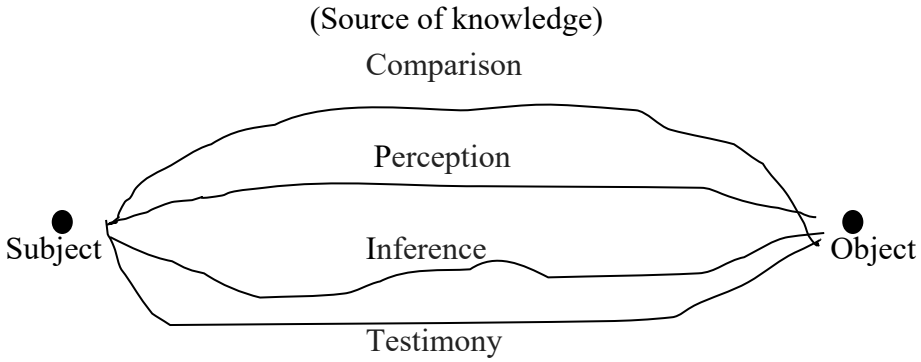

Fig. 1

Jnana (knowledge) is a tattva (theory). There are four akaras (forms) of this tattva. These akaras are category (padartha), assertion (vivrti), dimension (matra) and quantity (rashi).

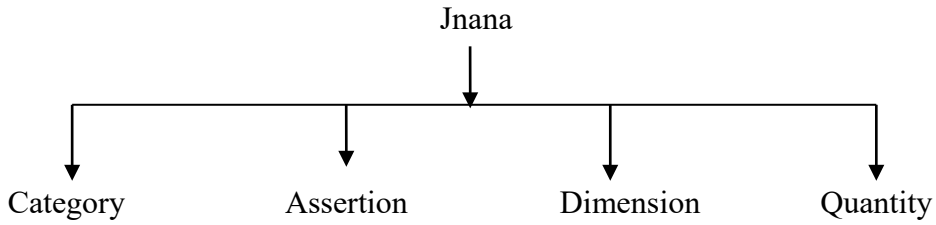

Fig. 2

We get the following figure from Modelling of Generancy.

ই (Jnana) ⇓

এ (Category) ↘

ঞ (Name) ⇒

এ৩ (Assertion) ↘

ট (Positivity) ⇒ ঠ (Negativity)

ঐ (Dimension) ↘

ড (North) ⇒ ত (East) ⇒ ণ (Up)

ঐ৩(Quantity) ↘

ত (Force) ⇒ থ (Mass) ⇒ দ (Space) ⇒ ধ (Time)

Fig. 3

From the figure we get five decisions.

Decision 1 Name follows the point rule. Category is related to name.

এ (Category) ↘ ঞ (Name) ⇒

Decision 2 Positivity and negativity follow the balance rule. Assertion is related to these (positivity and negativity).

এ৩ (Assertion) ↘ ট (Positivity) ⇒ ঠ (Negativity)

Decision 3 North, east and up follow the left hand rule. Dimension is related to these (north, east and up).

ঐ (Dimension) ↘ ড (North) ⇒ ত (East) ⇒ ণ (Up)

Decision 4 Force, mass, space and time follow the cross rule. Quantity is related to these (force, mass, space and time).

ঐ৩(Quantity) ↘ ত (Force) ⇒ থ (Mass) ⇒ দ (Space) ⇒ ধ (Time)

Decision 5 Category, assertion, dimension and quantity are related. Jnana is the cause of these (category, assertion, dimension and quantity).

ই (Jnana) ⇓এ (Category) ↘ এ৩ (Assertion) ↘ ঐ(Dimension) ↘ ঐ৩(Quantity)↘

Here jnana is tattva. Category, assertion, dimension and quantity are akaras. Name, positivity, negativity, north, east, up, force, mass, space and time are upakaranas. So we find the following table by rewriting figure 3.

Tattva (theory)	Akara (form)	Upakarana (component)
ই (Jnana) ⇓	এ (Category) ↘	ঞ (Name) ⇒
	এ৩(Assertion) ↘	ট (Positivity) ⇒ ঠ (Negativity) ⇒
	ঐ(Dimension) ↘	ড (North) ⇒ ত (East) ⇒ ণ (Up) ⇒
	ঐ৩(Quantity) ↘	ত(Force) ⇒ থ(Mass) ⇒ দ(Space) ⇒ ধ(Time) ⇒

Tab. 1

3. Methods of Gaining Knowledge

3.1 Argumentism

In order to gain proper knowledge about something, one has to follow a certain method. Western philosophers followed different methods to gain knowledge. These are dogmatism, scepticism and dialectic method etc.

Dogmatism introduces philosophical discussion without following the origin and conditions of knowledge. This method initiates philosophical discussions based on superstition and previous ideas. This method accepts the truth and falsehood of knowledge without judgment.

Scepticism expresses doubt on the possibilities of theoretical knowledge. According to this doctrine, knowledge is not precise and certain. Dogmatism accepts the truth of knowledge without considering judgment and scepticism denies the truth of knowledge.

The name given to the combination of two opposing ideas is the dialectic method. In this method, the knower acquires correct knowledge through the combination of thesis, antithesis and synthesis. This process does not stop at the first adjustment. Here the first time adjustment appears as thesis for the second time. This thesis has antithesis again. Thus the dialectic method continues until the absolute truth is reached.

However the unsuspicious can be found through doubt. Where there is no doubt, dogmatism is born. But doubting something does not mean denying it. So everything in the world has to be doubted like Rene Descartes. There is no question of reasoning

without doubting something. Therefore, argument is the only ideal method of gaining knowledge. I think only argument is appropriate as the ideal method of philosophical discussion.

There is a thesis (beginning proposition) first in this argumentism. This thesis becomes antithesis (negation of that thesis) through doubt. Later, through argument, thesis and antithesis were combined to form synthesis (new proposition that combines two conflicting ideas). Here too, the first coordination appears as the thesis for the second time. This thesis turns into antithesis through doubt and later synthesis is formed by combining through argument. This method continues until it reaches the absolute truth. This method is called argumentism.

The following figures illustrate the argumentism.

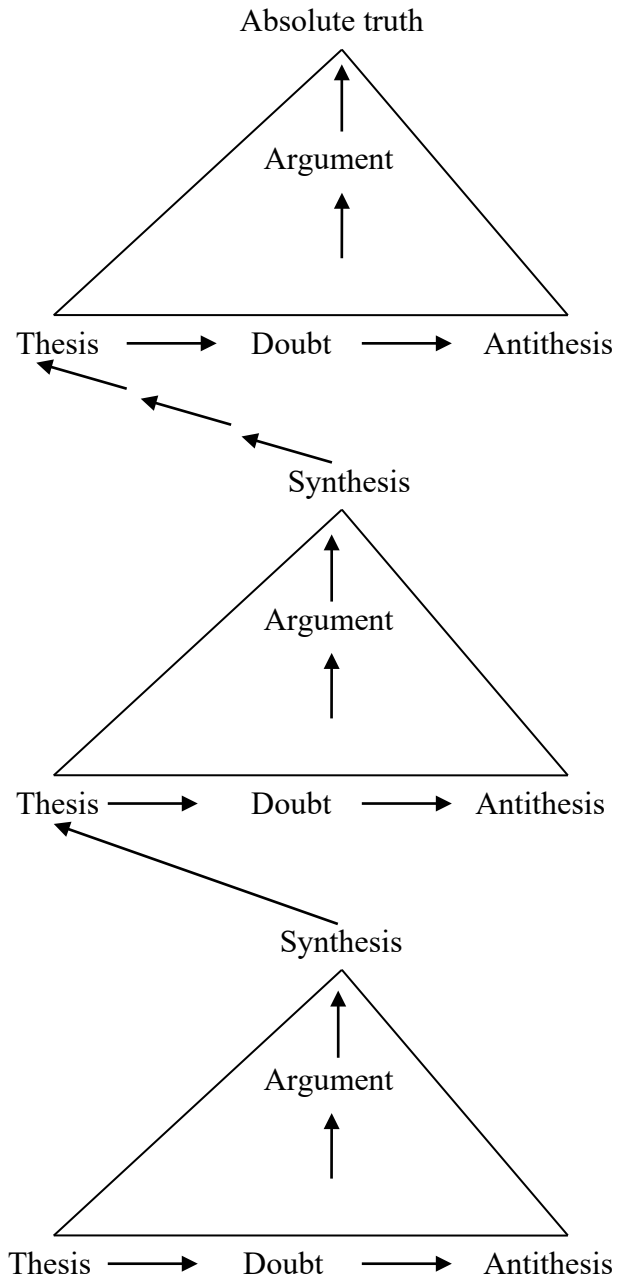

Fig. 4

To know an object, the knower has to go a long way. The matter can be explained in a very simple way. Suppose a Cartesian coordinate where the object is at the point P. The knower is at the point O. Then the knower has to go from point O to point P. Let's explain the matter with the help of a figure.

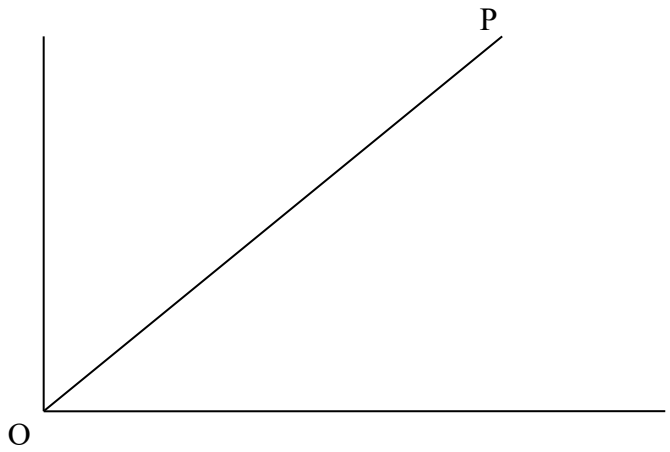

Fig. 5

Here the knower has to go from point O to point P. He or she has to step on every point. If one point is left out, there will be discontinuity. Then there will be no proper knowledge. Therefore, the matter of gaining knowledge has to be acquired. There is no short or easy way to acquire knowledge. Knowledge is a matter of achievement.

4. Origin of Knowledge

4.1 Cognitism

According to the empiricists, knowledge can be gained only through experience. They consider experience as a source of accurate knowledge. Experience is sensation or sense feeling. By senses we mean five external senses, viz. the eyes (caksu), the ears (srotra), the nostrils (ghrana), the tongue (rasana) and the skin (tvak). According to empiricism, the five senses are the only means of gaining knowledge.

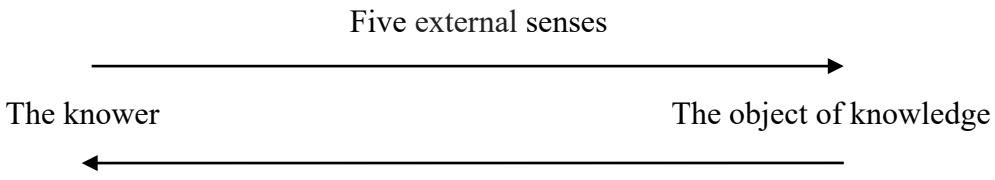

Fig. 6

Again, according to rationalism, intellect is the only means of gaining knowledge. According to the rationalists, proper knowledge can be gained through intellect. The knowledge that can be obtained with the help of the five senses is inconsistent and there is

no perfection in this knowledge. Intellect is the natural quality of the mind. The mind naturally generates knowledge from its inner perception.

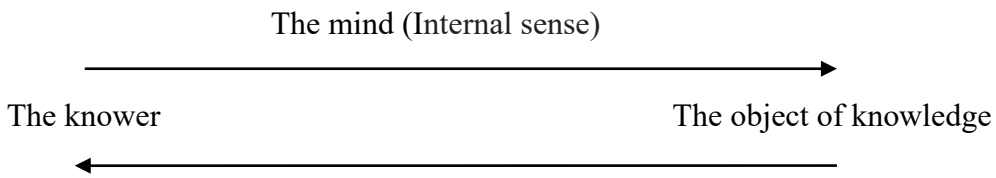

Fig. 7

According to criticism (critical theory of Kant), not only experience or intellect produces knowledge, but also experience and intellect are required for the origin of knowledge. Experience gives the element of knowledge and intellect gives the shape of knowledge. Through sensation we get the element of knowledge and that element is integrated by the intellect and produces knowledge.

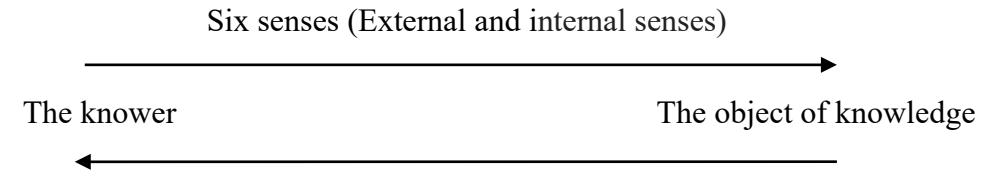

Fig. 8

Indian philosophers consider perception (pratyaksa) to be one of the sources of true knowledge. According to them, there are more sources of true knowledge, for example, inference (anumana), comparison (upamana) and testimony (sabda). However, this perception is again of two types, namely, external perception (bahya pratyaksa) and internal perception (antara pratyaksa). External perception is the perception of the five senses. Internal perception is the perception of the mind. In Indian philosophy, the mind is called the sixth sense. Therefore, according to Indian philosophy, the knowledge that is obtained through perception, according to Western philosophy, it is obtained through empiricism, rationalism and criticism.

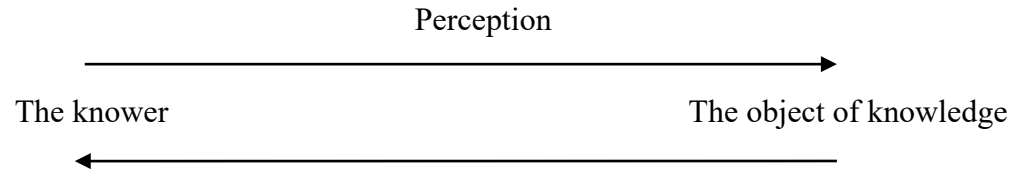

Fig. 9

Here perception means perception with the help of six senses. The sensation of the five senses give the material of knowledge and the intellect which is the characteristics of

the mind give the shape of knowledge. Beyond this there are sources of knowledge such as inference, comparison and testimony. Perception, inference, comparison and testimony are the four aspects of human consciousness or cognition. Therefore, cognition can be considered as the only source of knowledge. The knower acquires accurate knowledge of the knowable object with the help of cognition.

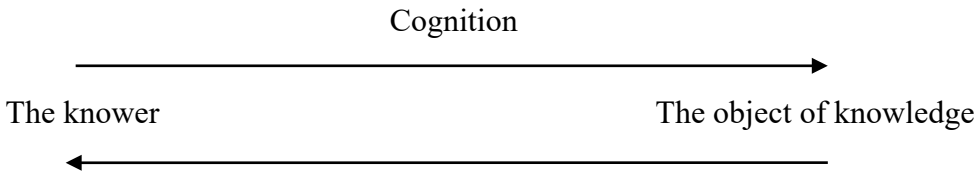

Fig. 10

Now let us discuss these four types of cognition separately.

4.2 Pratyaksa

The knowledge gained through the connection of the senses with the object is called pratyaksa or perception. First of all, pratyaksa is of two types, namely, laukika pratyaksa (ordinary perception) and alaukika pratyaksa (extraordinary perception). The perception in which indriya sannikarsa (the contact of the senses with their objects) is simple and usual is called laukika pratyaksa. The perception that occurs with the help of five external senses such as eyes, ears, etc., and internal sense mind is laukika pratyaksa. On the other hand, the perception in which indriya sannikarsa is unusual or miraculous is called alaukika pratyaksa. In the extraordinary perception, the senses do not have a usual connection with the object, but are perceived in an extraordinary way.

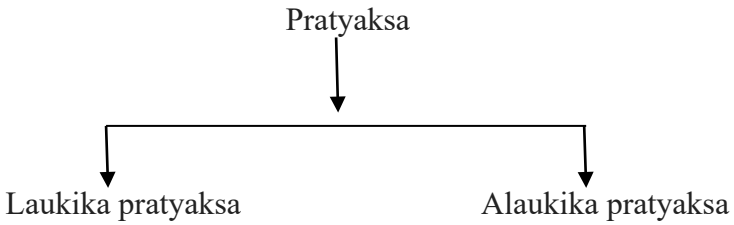

Fig. 11

Laukika pratyaksa is again of two kinds, namely, bahya pratyaksa (external perception) and antara pratyaksa (internal perception). The knowledge that comes with the help of the five external senses, namely, the eyes (caksu), the ears (srotra), the nostrils (ghrana), the tongue (rasana) and the skin (tvak), are called external perception. Again, the perception in connection with the mind through the mental process of thinking, feeling etc. is called internal perception.

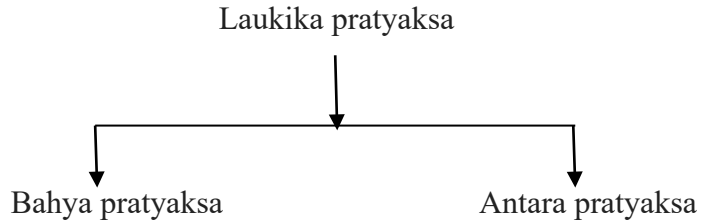

Fig. 12

According to another view, ordinary perception or laukika pratyaksa may be divided into three parts, namely, nirvikalpa pratyaksa (indeterminate perception), savikalpa pratyaksa (determinate perception) and pratyabhijna (recognition). An object which is known only as an object that is merely the existence of the object is known is called nirvikalpa pratyaksa. The ordinary perception which has the knowledge of the existence of an object and its class and various qualities is called savikalpa pratyaksa. Pratyabhijna or recognition is to cognize a person or an object as pre-identified.

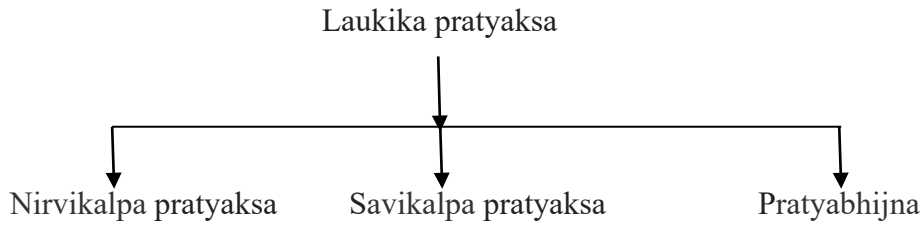

Fig. 13

Alaukika pratyaksa or extraordinary perception is of three types, namely, samanyalaksana, jnanalaksana and yogaja. The perception of a person or an object where the entire class is perceived on the basis of the generality of that class of person or object then it is called samanyalaksana perception. Again with the help of a sense, when perceiving an object, if the qualities attributable to other senses are perceived then it is called jnanalaksana perception. With the help of intuition or with the help of supernatural power generated by devout meditation, what the yogis perceive in which the past, present, future, distant and finer objects is called yogaja perception.

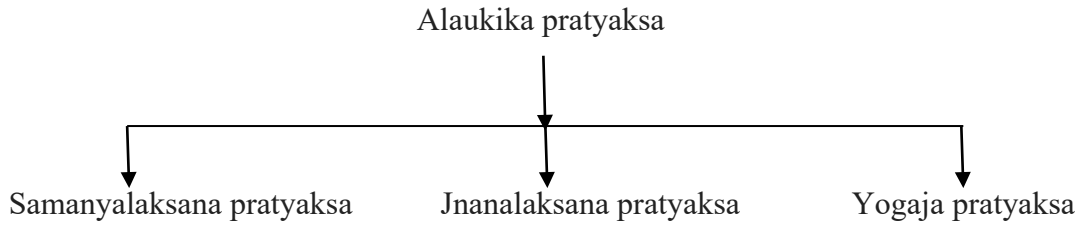

Fig. 14

4.3 Anumana

Depending on what is known and supported by it, if it is possible to know about something unknown, then it is called anumana or inference. There are three terms in an inference. They are sadhya (major term), paksa (minor term) and hetu (middle term). What is inferred is sadhya, that is where the existence of sadhya is inferred is paksa and the term that establish the link between the sadhya and the paksa is hetu. Another name for hetu is linga or sadhana. The following is an illustration of the terms with an example.

There is smoke on the hill.

Wherever there is smoke, there is fire.

Therefore, there is fire on the hill.

In the above inference, fire is sadhya or major term, because, on that inference, fire is inferred, the hill is paksa or minor term, because the existence of fire is inferred in the hill and the smoke is hetu or linga because fire is inferred on the basis of smoke. Each inference has at least three propositions. An invariable concomitance relation between the hetu and the sadhya is called vyapti. The propositions are called the avayavas or members of syllogism.

On the basis of the purpose of which the inference is fulfilled, the inference can be divided into two parts. They are svarthanumana (inference for oneself) and pararthanumana (inference for others). The inference that one is made to gain knowledge for himself is svarthanumana and the inference that one assumes something to prove to other is pararthanumana.

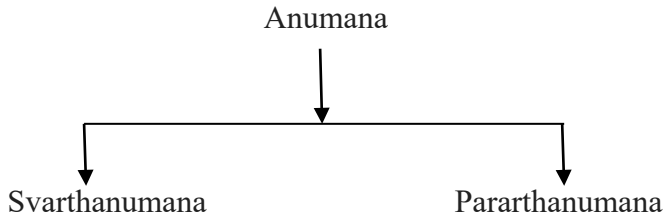

Fig. 15

According to the systematic differences in the journey from known truth to unknown truth, the inference can be divided into three parts. They are purvavat, sesavat and samanyatodrsta. The inference that infers unperceived effect by perceiving the cause is called purvavat anumana. The inference that infers unperceived cause by perceiving the effect is called sesavat anumana. The inference that is made based on prior experience and similarity, not based on causal relationships, is called samanyatodrsta anumana.

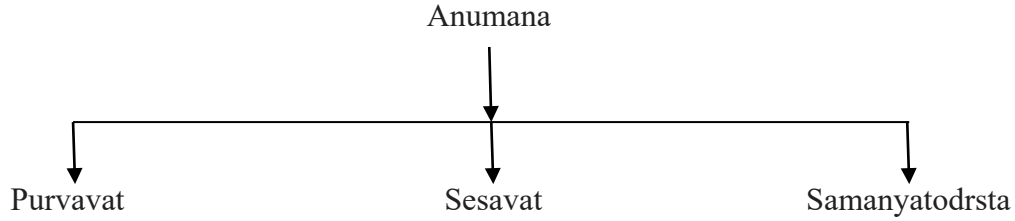

Fig. 16

The inferences can be divided into three, based on the point of view of induction of vyapti between the hetu and the sadhya. They are kevalanvayi anumana, kevalavyatireki anumana and anvayavyatireki anumana.

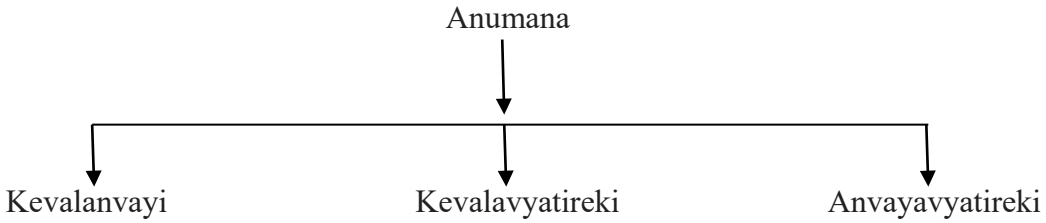

Fig. 17

The inference where hetu (middle term) looks like a reason but not actually so, that inference is misleading and the name of this delusion is hetvabhasa or fallacies of inference. There are five kinds of hetvabhasa, namely, savyabhicara, viruddha, satpratipaksa, asiddha and badhita.

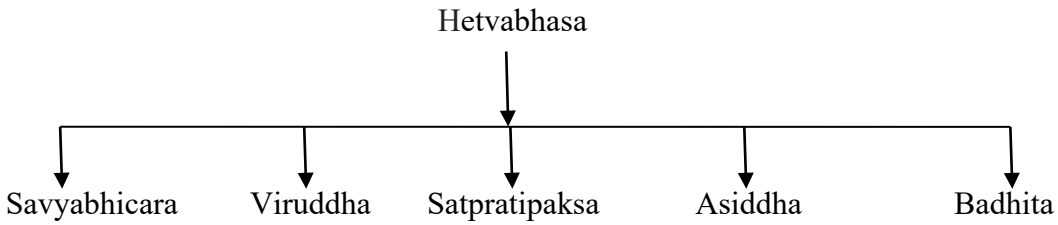

Fig. 18

4.4 Upamana

When knowledge of a new object is obtained by observing the similarity of a new and unfamiliar object with a previously known object, the method of acquiring that knowledge is called upamana or comparison. Let us understand the matter with the help of an example. No one has seen gavaya (wild cow) before. One of the forest dwellers told him that gavaya looks like a cow. Going into the forest, the man saw a new animal and noticed that the new animal resembled a cow. Then, with the help of the description of the forest dweller, he recognized the new animal as gavaya. Upamana is the way of knowing the denotation of words, i.e., the relation between names and the objects denoted by the names. There are two factors involved in a comparison which are (1) gain knowledge about an unfamiliar object that has not been seen before and (2) knowledge of the resemblance of a new unfamiliar object to a previously familiar object.

4.5 Sabda

Sabda or testimony is the word of a trustworthy person. Trustworthy person is the one who knows the truth and tells the truth. It is also called aptavakya. The knowledge that derives from sabda or aptavakya is called sabda-jnana.

According to the object of knowledge, sabda-pramana is of two kinds, namely, drstartha or that relating to perceptible objects and adrstartha or that relating to imperceptible objects. The words of a trustworthy person about sensible objects or things is called drstartha sabda pramana. Again the words of a trustworthy person about an object or thing that is not sensible is called adrstartha sabda pramana.

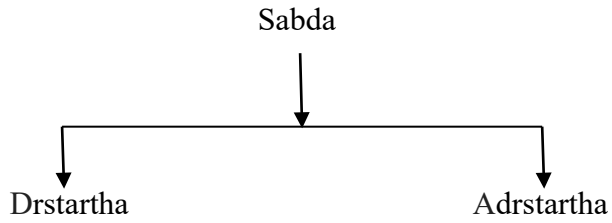

Fig. 19

According to another classification, there are two kinds of sabda jnana, one is vaidika or scriptural and other is laukika or secular. The words of the Vedas are vaidika sabda pramana. The vaidika testimony is the words of God and so is perfect. Again the words of human beings are laukika sabda pramana. The knowledge that comes from laukika sabda pramana is likely to go astray.

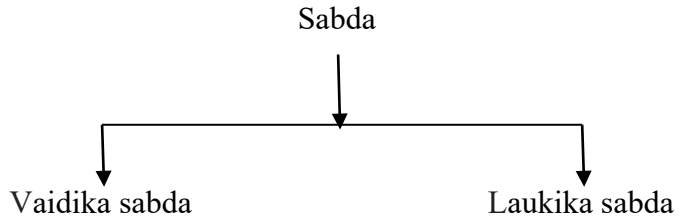

Fig. 20

5. Nature of Known Object

5.1 Relativism

Humans are social creatures. He has to face different situations to continue in the society. People have to acquire knowledge to sustain life. Now our topic is what is the nature of the known object or knowable object? There are differences among philosophers about this. If there is to be knowledge, both the knower and the object to be known are needed. The one who acquires knowledge of the object is called the knower and the object that one has knowledge of is called the known object. So to be knowledge, both individuals and objects are needed. Knowledge reveals the relationship between the knower and the known object.

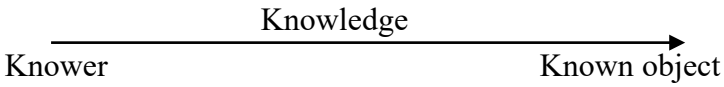

Fig. 21

Different philosophers have expressed different views on the nature of known objects. There is a group of philosophers who think that a known object has a mind-neutral or knowledge-neutral entity. Their doctrine is called realism. Again there are other philosophers who think that the known object is dependent on the mind or knowledge. Their doctrine is called idealism. The realists want to establish substance as the substratum of quality as an out-of-mind entity. They want to protect the sovereignty of nature. On the other hand, the idealists want to make all kinds of qualities of objects dependent on the mind and substance the substratum of the qualities to be made dependent on the mind. The realists are object-centered and the idealists are self-centered.

What is the nature of the known object? I will try to answer this question in a different way. We know that we can gain accurate knowledge only through cognition. Cognition is perception (pratyaksa), inference (anumana), comparison (upamana) and testimony (Sabda). Perception is a kind of cognition. This perception can be the perception of the five senses (external perception) or the perception in connection with the mind (internal perception). It is important to remember that the mind is also a kind of sense. In Indian philosophy, the mind is called the sixth sense. Therefore, the question of whether the existence of an out-of-mind entity is acceptable or excluded is not more important. Through the five senses perception we get the element (contents) of knowledge and through the mind sense perception we get the shape (concepts) of knowledge. The realists make the existence of known objects mind-neutral. On the other hand the idealists make the existence of known objects dependent on the mind. The mind has a role to play in knowing objects. Because intellect is the quality of the mind and if there is no intellect, knowledge is not its shape. Without the shape of knowledge, knowledge is not integrated and well-organized.

Thus the nature of the knowable object depends on the cognition of the knower. That is, the nature of the knowable object is relative. This is normal that the nature of the knowable object will depend on the knower, because the knower knows the matter. Now it can be said that known objects are perception-dependent, inference-dependent, comparison-dependent and testimony-dependent. Perception-dependent means perception-dependent of the five senses or perception-dependent of the mind.

So the nature of the knowable object depends on how the knower knows the object. Therefore the nature of the known object is relative. The matter can be explained with the help of mathematics.

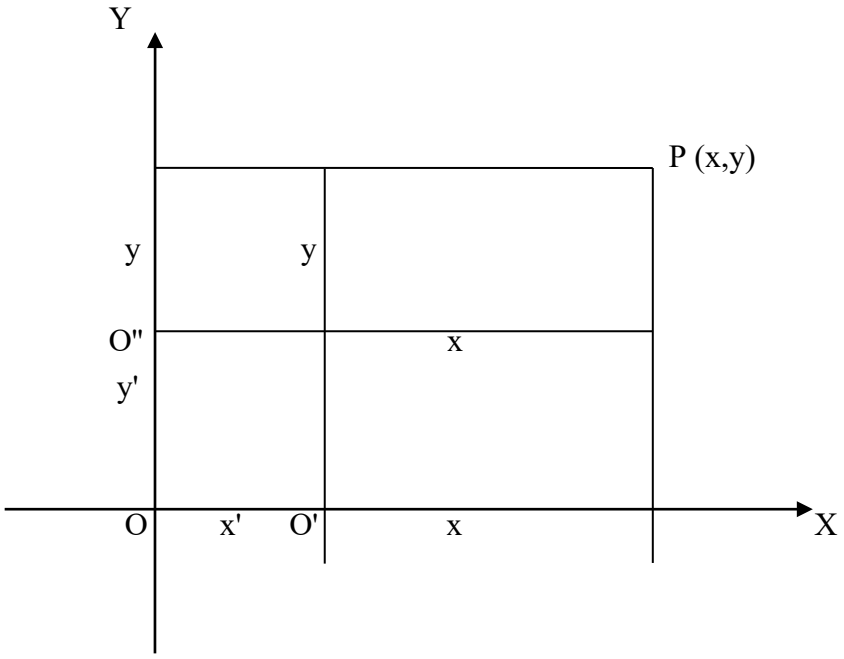

Fig. 22

Suppose XOY indicates the Cartesian coordinate system. Here the knower is in O position. The knowable object is in the P position. Then the position of the knowable object will be P = (x, y). Now suppose, if the knower moves x' amount along the X axis, then the position of the knower will be O'. Then if the knower wants to know the position of the object, the position will be P (x–x', y). On the other hand, if the knower moves y' amount along the y axis, then the position of the knower will be O". Then if the knower wants to know the position of the object, then the position of the object will be P (x, y–y'). So it can be said that the nature of the known object is relative. This doctrine is called relativism.

6. Category

Category is padartha. Padasya artha: padartha- that is, all things indicated by words are padarthas. Can not imagine anything on this universe that has no name. Padartha is the object of what is known with the name. Whatever knowledge matters, it certainly has a name. The topic that is specified by word is padartha.

There are four types of padarthas, namely, dravya (substance), guna (quality), karma (action) and samannaya (adjustment).

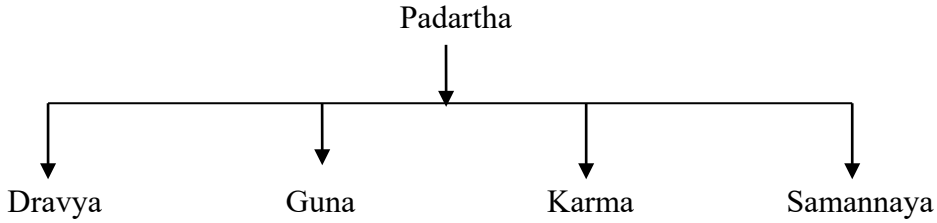

Fig. 23

The padarthas or categories of Generancy philosophy and Vaisesika philosophy can be arranged with the following table.

Padartha	Generancy philosophy	Vaisesika philosophy
	Dravya	Dravya
	Guna	Guna, samanya and visesa
	Karma	Karma
	Samannaya	Samyoga and samavaya
		Abhava or non-existence

Tab. 2

What is abhava or non-existence in the Vaisesika philosophy is the absence of anything. Abhava or non-existence is the opposite of existence. Abhava is a negative category or padartha.

According to the Nyaya philosophy sixteen categories or padarthas have been acknowledged. These are (1) pramana (valid means of knowledge), (2) prameya (objects of valid knowledge), (3) samsaya (doubt), (4) prayojana (aim), (5) drstanta (example), (6) siddhanta (conclusion), (7) avayava (members of syllogism), (8) tarka (hypothetical argument), (9) nirnaya (settlement), (10) vada (discussion), (11) jalpa (wrangling), (12) vitanda (cavilling), (13) hetvabhasa (fallacy), (14) chala (quibbling), (15) jati (sophisticated refutation) (16) nigrahasthana (point of defeat). According to the Vaisesika philosophy, padarthas are of seven kinds, namely, dravya (substance), guna (quality), karma (action), samanya (generality or universal), visesa (particularity), samavaya (inherence) and abhava (non-existence).

6.1 Name

A name is a term that identifies a padartha or category. Everything around us has a name to mark it. Without a name we cannot identify anything. In order to gain knowledge of something, it is important to know the name first. Now let us discuss about the four types of categories, namely dravya, guna, karma and samannaya. The prerequisite for knowledge of an object is to find out the appropriate name of that object. For example, it is ignorant to call the imaginary number as a real number; to call an imaginary number as an imaginary number is knowledge.

6.1.1 Dravya

The category on which quality and action resides is called dravya or substance. Quality is simply the quality of a substance and action is simply the action of a substance. Without substance there can be no quality and action. So a substance is the basement or substratum of quality and action.

According to the Vaisesika system, dravya or substance is of nine kinds, namely, ksiti (soil), jala (water), agni (fire), vayu (air), akasa (ether), dik (space), kala (time), atma (soul) and manas (mind).

6.1.2 Guna

The category or substance that resides in dravya or substance and which has no action is guna or quality. Quality is always based on the substance. Substance is the base of quality. Without substance, there is no separate existence of quality. Therefore, quality is the extra substance category and depending on a substance. Quality exists in the substance as the inactive (niskriya) adjective of the substance. Even if the quality exists in the substance, it is different from the substance. It is different from action too. Quality is stable and passive.

According to the Vaisesika system, gunas or qualities are twenty-four, namely, rupa (colour), rasa (taste), gandha (smell), sparsa (touch), sabda (sound), sankhya (number), parimana (magnitude), prthaktva (distinctness), samyoga (conjunction), vibhaga (disjunction), paratva (remoteness), aparatva (nearness), buddhi (cognition), sukha (pleasure), duhkha (suffering), iccha (desire), dvesa (aversion), prayatna (effort), gurutva (heaviness), dravatva (fluidity), sneha (viscidity), samskara (tendency), dharma (merit) and adharma (demerit).

6.1.3 Karma

The motion of the material objects is karma or action. Like quality the base or substratum of action is substance. But action is different from substance and quality. The difference between action and quality is that action is dynamic and active, while quality is stable and passive. The action of the limited corporeal substances (murtadravya) is known through its function and motion. The limited corporeal substances are earth, water, light, air and the mind. Karma is regarded as the independent cause of the conjunction and disjunction of objects.

6.1.4 Samannaya

There are three main types of samannayas (adjustments). These three types of adjustments are cause, relation and rule. Samavaya (inherence) and samyoga (conjunction) are also a kind of samannaya (adjustment). These issues were discussed in detail below.

6.1.4.1 Cause

The cause is the event which comes in invariable ways before the action or which is essential for the origin of the action. According to the Naiyayikas, a cause is an immediate, unconditional and invariable antecedent to the effect. The difference between effect and cause is that cause is the event preceded by effect and effect is the event followed by cause. Although the cause is a previous event, any previous event of an effect

cannot be called a cause. The cause must be the universal antecedent of the action, that is, the cause is the invariable antecedent of the action. Again no invariable previous event of action can be said to be the cause. Then the day could be called the cause of the night and the night as the cause of the day. So the cause is not only the invariable antecedents of the action, but the unconditional invariable antecedents of the action. Furthermore, the cause must be an immediate preceding event of the effect, i.e. if there is a long gap between the cause and the effect then another event may occur within that time which is related to the effect.

6.1.4.2 Relation

Think of a set where

$A = \{A_1, A_2, A_3, A_4, A_5\}$; $A_i \in A$

Here A_i is the element of A. Then it can be said that A_i is related to A. This is a membership relation. In the main theory, the relation is marked by the symbol ↘.

6.1.4.3 Rule

The rule is applied to make it easier to remember an equation. Such as X rule. With this rule we keep in mind, there are four quantities in this rule. With the help of this rule, we can know what is the changing between the two quantities keeping the other two quantities fixed. In the main theory, the rule is marked by the symbol ⇒.

6.1.4.4 Samavaya

Samavaya (inherence) is the name of the permanent and eternal relationship between two categories. For example, the relationship of fabrics and yarn. One of the two related categories resides in the other. Such as fabrics are located in the yarn. One of the inherence categories cannot be separated from the other. If one of the two objects cannot be separated from the other, that is, if the separation causes loss of existence of one of them, then they are called ayutasiddha or inseparable entities. So inherence is ayutasiddha relation.

The relationship of the whole to the part, the relationship of quality and action to the substances, etc., are examples of samavaya or inherence. Here we see that the cloth as a whole is located in the yarn, the white color as a quality is located in the buck, the motion as the action is located in the moving car. Terms relating to samavaya cannot be reversed. For example, it can be said that quality resides in substance, but substance resides in quality, it cannot be said. Inherence is permanent, eternal and internal relation. Internal relations are called because at least one of the two samavaya objects depends on the other.

6.1.4.5 Samyoga

If two objects can exist separately and the impermanent relationship that is formed between them is called samyoga or conjunction relationship. For example, as long as I put the book on the table, the connection of the book with the table is made. Picking up the

book from the table will disconnect the book with the table. So this relationship is temporary. Conjunctions may be in isolation. If one of the two objects can be separated from the other and there is no loss of their existence, then they are called yutasiddha or separable entities. So the conjunction is the yutasiddha relationship.

The existence of the two connected objects does not depend on the conjunction or samyoga relationship. For example, a bird flew over the tree. It established the relationship of bird with tree. This relationship is not a permanent or eternal relationship. Tree and bird existed even before this relationship was formed. Terms relating to samyoga can be reversed. If it is said that the book is connected to the table, then it can also be said that the table is connected to the book.

Now from the decision 1

We get name follows the point rule. Category is related to name.

ക (Category) ↘ ഞ (Name) ⇒

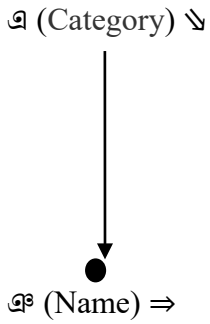

Fig. 24

We get one law from point rule.

Law 1.1 ഞ (Name) = ഞ (Name)

Explanation of the law is name merely equal to name.

7. Assertion

An assertion is the correct and definitive description of an object. A confident and forceful statement about an object is the assertion. With an assertion, one can get accurate knowledge of a topic. An assertion reveals the attitude of a name. There are two types of attitudes of an assertion, namely: positivity and negativity.

7.1 Positivity

Positivity means thinking in an optimistic way, looking for solutions, expecting good results and success. It is the practice of being or tendency to be positive or optimistic in

attitude. Positivity associated with emotions of joy, love and inspiration. It also associated with thoughts of courage, certainty and success.

The following figure explains a positivity.

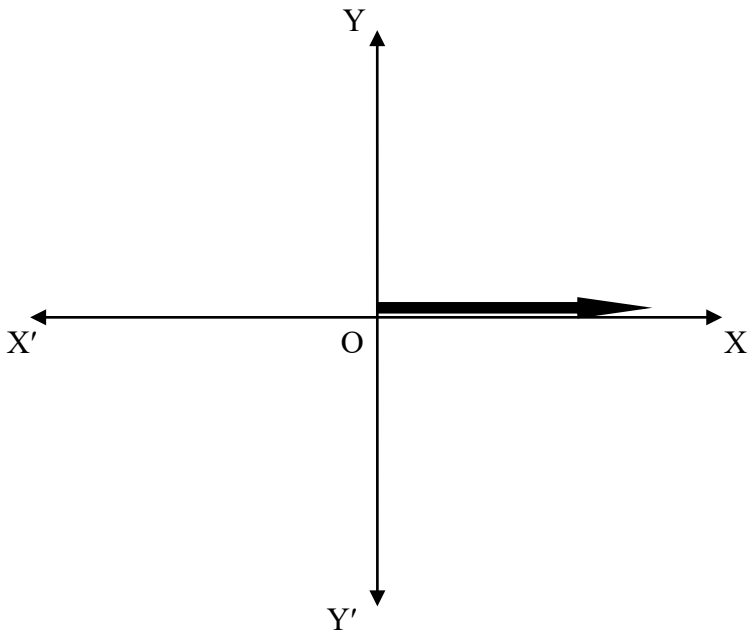

Fig. 25

If there is an object to the right of the origin in the Cartesian co-ordinate system is positive and this position assertion of the object is called positivity.

7.2 Negativity

Negativity is one where there is no positivity. It is something that is not positive. Negativity is expressing, containing, or consisting of a negation, refusal, or denial. It is lacking positive or constructive features.

The following figure explains a negativity.

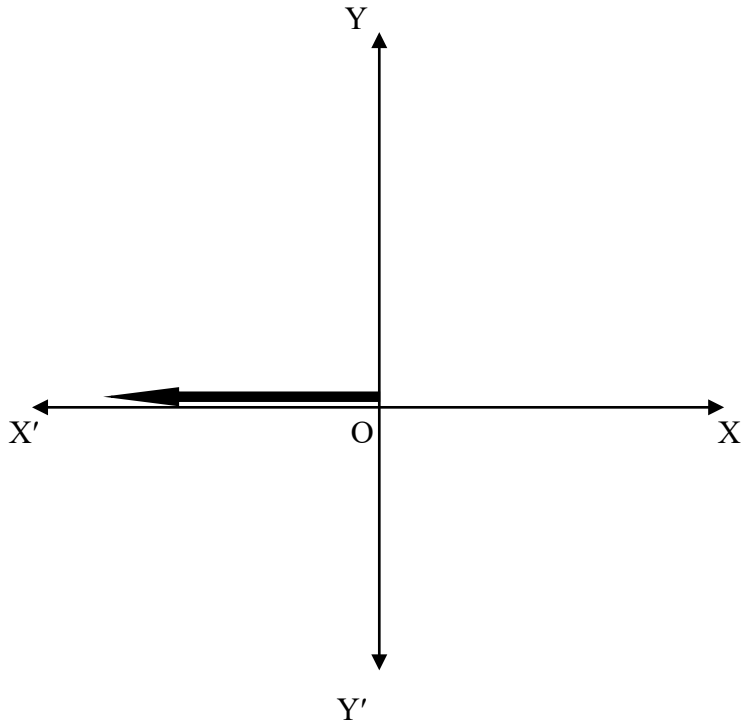

Fig. 26

If there is an object to the left of the origin in the Cartesian co-ordinate system is negative and this position assertion of the object is called negativity.

Now from the decision 2

We get positivity and negativity follow the balance rule. Assertion is related to these (positivity and negativity).

এ৩ (Assertion) ↘ ট (Positivity) ⇒ ঠ (Negativity)

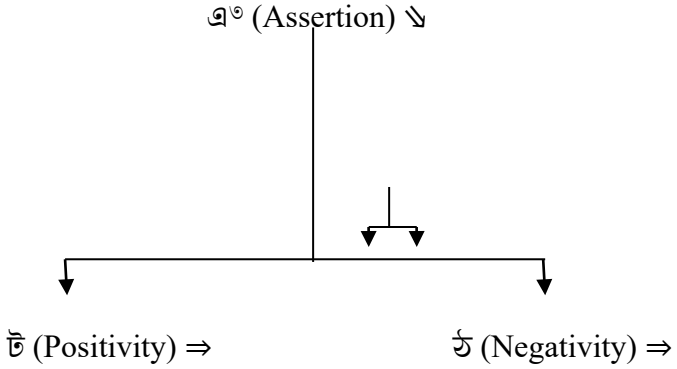

Fig. 27

We get one law from balance rule.

Law 2.1 ঊ (Positivity) ∝ ঔ (Negativity)

Explanation of the law is positivity directly proportional to negativity.

8. Dimension

The expansion of padartha is called dimension. Dimension is three. They are north, east and up. Any padartha or category is tri-dimensional. That is all objects bearing a name have three dimensions. On the other hand, all objects can be positioned on these three sides. Now let us describe the dimensions.

8.1 North

In the Cartesian co-ordinate system north and south is YOY′ axis where north is OY axis and south is OY′ axis.

In the following figure the arrow sign to the OY axis is north and the arrow sign to the OY′ axis is south.

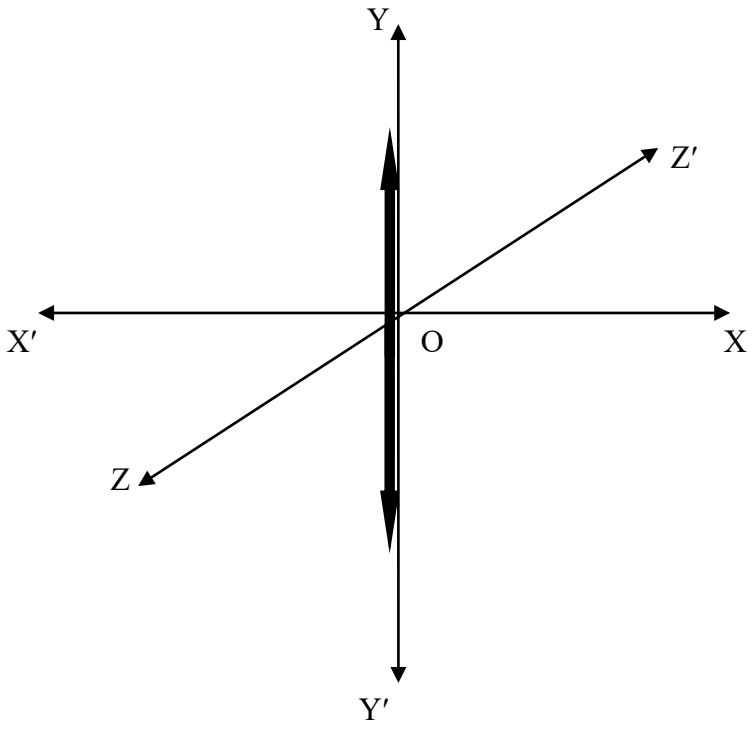

Fig. 28

8.2 East

In the Cartesian co-ordinate system east and west is XOX′ axis where east is OX axis and west is OX′ axis.

In the following figure the arrow sign to the OX axis is east and the arrow sign to the OX′ axis is west.

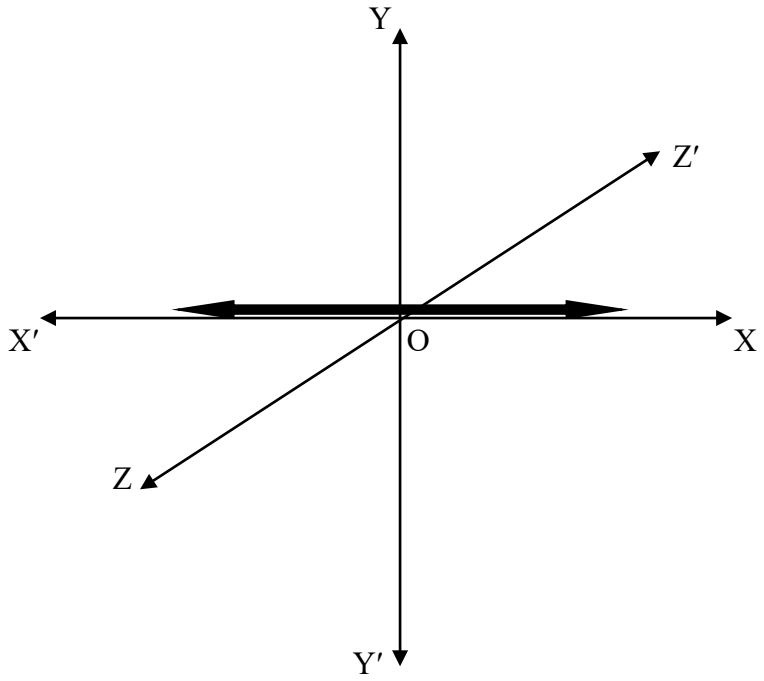

Fig. 29

8.3 Up

In the Cartesian co-ordinate system up and down is ZOZ′ axis where up is OZ axis and down is OZ′ axis.

In the following figure the arrow sign to the OZ axis is up and the arrow sign to the OZ′ axis is down.

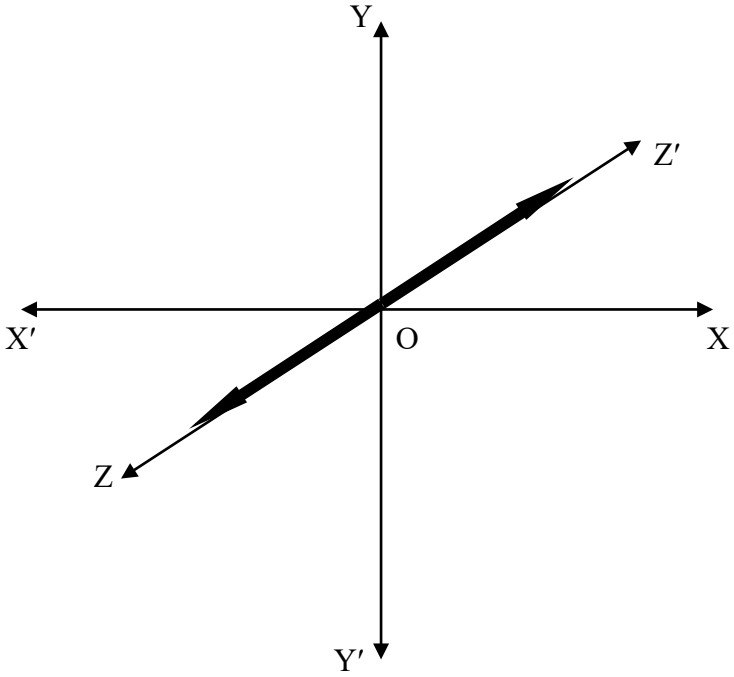

Fig. 30

Now from the decision 3

We get north, east and up follow the left hand rule. Dimension is related to these (north, east and up).

ঐ (Dimension) ↘ ড (North) ⇒ ত (East) ⇒ ণ (Up)

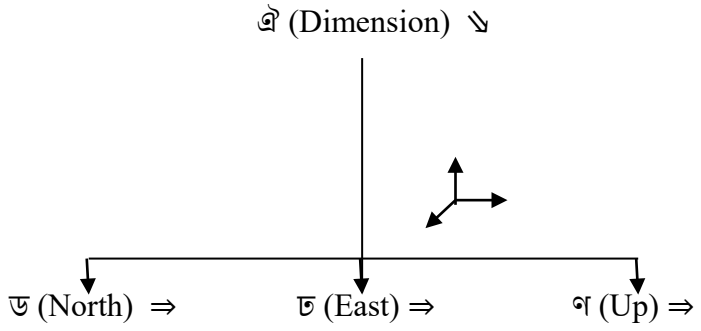

Fig. 31

We get three laws from left hand rule.

Law 3.1 Keeping ড (North) constant, ত (East) is inversely proportional to ণ (Up), i. e., ত (East) ∝ 1/ ণ (Up)

Law 3.2 Keeping ত (East) constant, ড (North) is inversely proportional to ণ (Up), i. e., ড (North) ∝ 1/ ণ (Up)

Law 3.3 Keeping ণ (Up) constant, ড (North) is inversely proportional to ত (East), i. e., ড (North) ∝ 1/ ত (East)

9. Quantity

What we measure in a categoty or padartha is called quantity or rashi. For example, we measure length and mass of a table. Then length and mass are quantities. Again let us find out how many times a car is running and what is the force of the car? Then time and force acting on the car are quantities. There are many quantities in this physical world. Firstly, the quantity can be divided into two parts, namely, fundamental quantity and derived quantity.

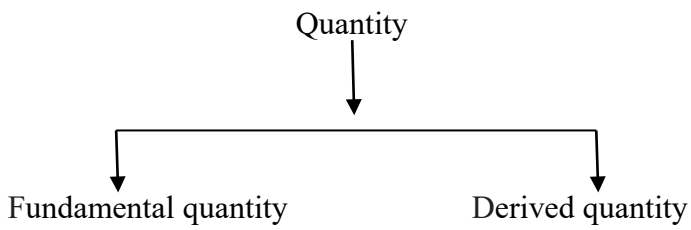

Fig. 32

To measure the quantity that do not require any other quantities are called fundamental quantity. For example, if the length and mass of the table is measured, only the length and mass are measured. No other measurements are needed. Again, the force applied to a moving object and the time to measure only force and time are measured. No other measurements are needed. So force, mass, space and time are fundamental quantities.

There are many quantities to measure them other quantities are needed. They are derived quantities. For example, to measure the velocity or speed of a moving vehicle, it is to measure that how much distance the vehicle crossed over time. Then the velocity or speed will be calculated by dividing the distance by time. Therefore, the velocity or speed is derived quantities. Again, to measure the density of a gold bar, you must measure the mass and volume of the gold bar. Then the density will be calculated by dividing the mass by volume. Therefore, the density is derived quantities.

Each of the numerous physical quantities used in science has its own unit. These units can be divided into two parts. They are fundamental unit and derived unit.

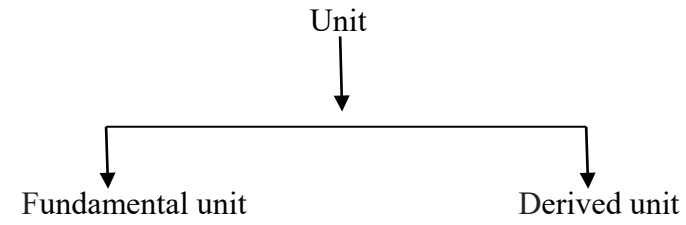

Fig. 33

A unit that does not depend on any other unit and is absolutely unrelated or independent is called a fundamental unit. Units such as force, mass, space and time do not depend on any other unit. So these four units are the fundamental units. The unit of force is newton, the unit of mass is kilogram, the unit of space is meter and the unit of time is second.

The unit that can be made based on the fundamental units are called derived unit. For example, velocity, acceleration, momentum etc. The velocity depends on the meter and second. That is

Velocity = $\frac{\text{meter}}{\text{second}}$

or, v = $\frac{\text{m}}{\text{s}}$

Again, the acceleration is also depends on the meter and second. That is

Acceleration = $\frac{\text{meter}}{\text{second}^2}$

or, a = $\frac{\text{m}}{\text{s}^2}$

Again, the momentum is also depends on the kilogram, meter and second. That is

Momentum = mass × velocity

or, p = kg × $\frac{\text{m}}{\text{s}}$

or, $p = \frac{kgm}{s}$

9.1 Force

We know that every object wants to maintain the state it is in, that is, if the object is stationary, it wants to remain stationary and if it is dynamic it wants to be dynamic. This property of object is called inertia. To change the inertia of the object, something has to be applied from the outside. An external cause is called force or bala which causes the object to move or wants to move, or to change or wants to change the motion of a moving object.

9.1.1 Fundamental Force

In nature we are familiar with different types of forces, but not all forces are fundamental. Those forces that are original or independent, that are not produced by any other force or form of any other force, but are expressed as other, are called fundamental forces. In Physics the fundamental forces are four. They are: gravitational force, electromagnetic force, strong nuclear force and weak nuclear force.

The interaction between any two objects in the universe is called the gravitational force. Gravity is a universal force. Every object in the universe feels this force because of another object. All objects on the surface feel this force because of the earth. The magnitude of this force is direct proportional to the product of the mass of the two acting objects and is inverse proportional to the square of the distance between the two. The range of gravitational force force is infinite. The carrier particles of gravitational force is gravitons (hypothetical).

There is a kind of force acting between two charged objects and between two magnets. They are called Coulomb's electric and magnetic forces, respectively. Electric force and magnetic force are closely related. The attraction or repulsion force that two charged particles exert on each other because of their charge is called electromagnetic force. The range of electromagnetic force is infinite. The carrier particles of electromagnetic force is photons. Structure of atoms and molecules, chemical reactions, thermal and other properties of matter are the result of electromagnetic force.

The nucleus of an atom is made up of protons and neutrons. Collectively they are called nucleons. The strong force that binds together nuclear elements in the nucleus of an atom is called a strong nuclear force. The strong nuclear force binds proton and neutron to the nucleus. This force is attractive and the range is short. The carrier particles of strong nuclear force is gluons.

The force that acts on the nucleus causing instability in the nucleus is called a weak nuclear force. When a β ray is emitted from a nucleus, then weak nuclear force arises. This is a weak force and range is short. The carrier particles of weak nuclear force is W and Z bosons.

9.1.2 Newton's Laws of Motion

In 1687, Sir Isaac Newton published three laws, establishing the relation between the mass, the motion, and the force of the object. These three laws are known as Newton's laws of motion.

Newton's first law states that if body at rest will remain at rest, and a body in motion will remain in motion unless it is acted upon by an external force. From the first law, we know that the object cannot change its position if no external force is applied to the object. If the object is in a stable state, it always wants to be stable, again once in a dynamic state it always wants to be dynamic. This particular properties of matter is called inertia. So this law is also called the law of inertia.

Newton's second law states that the rate of change of momentum is proportional to the force applied to the object. Where in the direction the force is acting, the changes in momentum also occur in that direction.

We can write with the help of symbols as

$\vec{p} = m\vec{v}$

where, $\vec{p}$ is momentum, m is mass and $\vec{v}$ is velocity.

Now according to Newton's second law, the rate of change of momentum is proportional to the force applied to the object. So, if the momentum is $\vec{p}$ and the force is $\vec{F}$, then

$\vec{F} \propto \frac{d\vec{p}}{dt}$

or, $\vec{F} \propto \frac{d}{dt} m\vec{v}$

or, $\vec{F} \propto m \frac{d}{dt} \vec{v}$

or, $\vec{F} \propto m\vec{a}$ [where, $\frac{d}{dt} \vec{v} = a$, acceleration]

or, $\vec{F} = km\vec{a}$

or, $\vec{F} = m\vec{a}$ where, k=1

So, the force acting on an object is equal to the mass of that object times its acceleration.

Newton's third law states that each action has an equal and opposite reaction. Newton's first and second laws are about a single object, while the third law is related to two objects.

Suppose P and Q are two objects. Then $\overrightarrow{F_1}$ is the attraction force by the second object Q on the first object P. And $\overrightarrow{F_2}$ is the attraction force by the first object P on the second object Q.

Then according to Newton's third law, we get

$\overrightarrow{F_1} = - \overrightarrow{F_2}$

9.1.3 Conservation of Momentum

When the net force exerted on a system composed of multiple objects is zero, the total momentum $\vec{P}$ of the system does not change over time. This is the conservation principle of momentum.

Suppose two objects with mass m_1 and m_2 collide while moving along the same straight line at $\overrightarrow{u_1}$ and $\overrightarrow{u_2}$ velocity, respectively. After the collision, the two objects moved along the same straight line at $\overrightarrow{v_1}$ and $\overrightarrow{v_2}$ velocity, respectively. So the total momentum of the two objects before the collision is $m_1\overrightarrow{u_1} + m_2\overrightarrow{u_2}$. And the total momentum of the objects after the collision is $m_1\overrightarrow{v_1} + m_2\overrightarrow{v_2}$.

Now if there is no external force applied, then according to the conservation principle of momentum,

$m_1\overrightarrow{u_1} + m_2\overrightarrow{u_2} = m_1\overrightarrow{v_1} + m_2\overrightarrow{v_2}$

Therefore the total linear momentum remains unchanged.

Similarly when the net torque exerted on a system is zero, the total angular momentum of the system is conserved.

The following figure explains a two- asserted force.

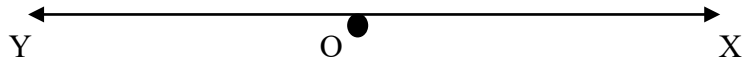

Fig. 34

The following figure explains a three-dimensional force.

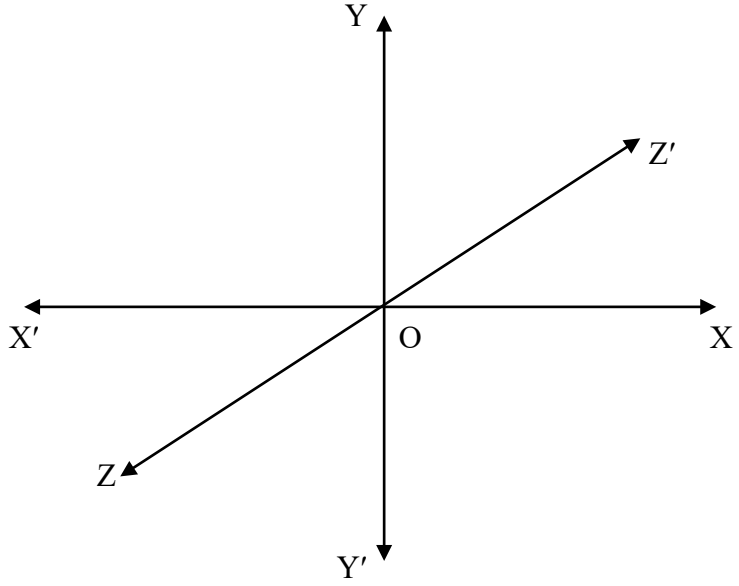

Fig. 35

9.2 Mass

Mass or bhara is an important concept in philosophy and physics. Mass is a measure of what is in that dravya or substance. Bhara or mass is one, eternal and all-pervading

substance. Bhara is not many, there seems to be a lot of masses for adding conditions (upadhi). We divide mass into bricks, a table, a book and so on if we need it. Bhara is boundless extent. In Newtonian physics, mass is irreversible, wherever it is measured, is equal everywhere. But there is a difference of opinion in modern physics. In modern physics, mass is not something constant, but mass is relative. Due to space and time, mass may vary for different individuals. It is two-asserted and three-dimensional. Here are some laws of mass described in physics.

9.2.1 Inertial Mass

According to Newton's second law of motion we get the inertial mass as

$m = \frac{F}{a}$

where, F is the force imposed on, m is the mass of the body and a is the acceleration.

9.2.2 Gravitational Mass

According to Newton's law of gravitation we get gravitational mass as

$m_g = \frac{Fd^2}{GM}$

where, m_g is the gravitational mass, F is the gravitational force, M is the mass of standard object, d is the distance of the two objects and G is the gravitational constant.

9.2.3 Relativistic Mass

According to Einstein's theory of relativity, the relativistic mass is given by

$m = \frac{m_0}{\sqrt{1-v^2/c^2}}$,

where, m = relativistic mass, m_0 = rest mass, v = velocity and c = speed of light.

The following figure is two- asserted mass.

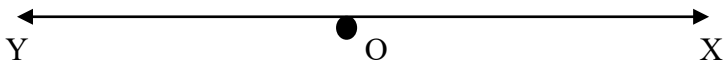

Fig. 36

The following figure is three-dimensional mass.

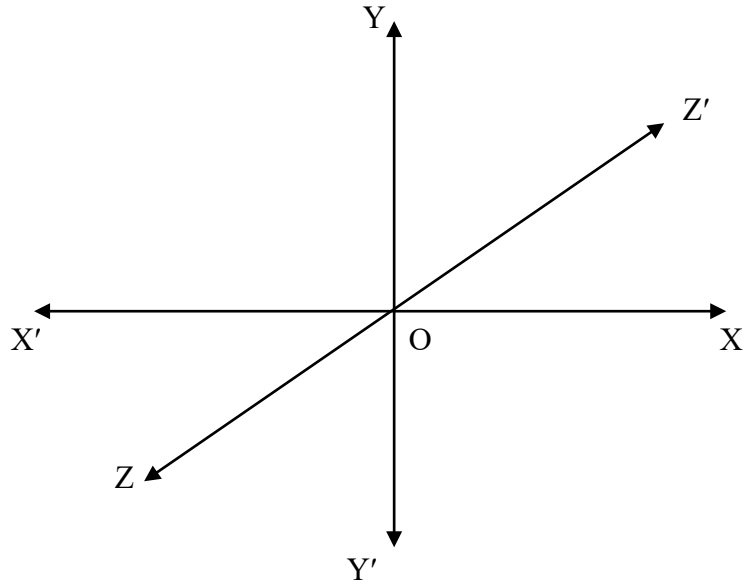

Fig. 37

9.3 Space

Space or sthana is one, eternal and all-pervading. Sthana is not many, there seems to be a lot of space for adding conditions. As a result, we have the idea of a vacant and full, here and there, near and far etc. Sthana is boundless extent. Sthana is one of the most important concepts in philosophy and physics. Space is needed to describe any event. Without knowing where an incident occurred, it is difficult to get a clear idea of the event. It is two-asserted and three-dimensional.

The following figure is two- asserted space.

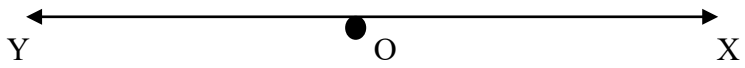

Fig. 9.38

The following figure is three-dimensional space.

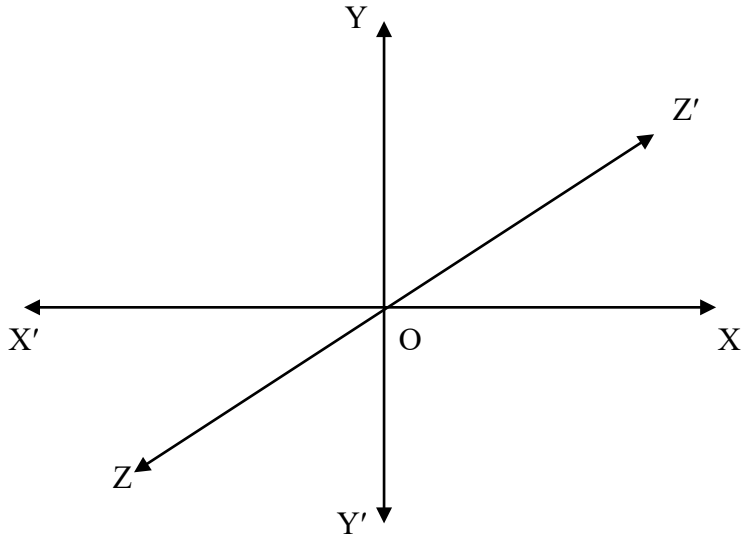

Fig. 39

9.4 Time

Like space or sthana, time or kala is one, eternal and all-pervading. Kala is not many, but the application of conditions (upadhi) make kala many. Time is the cause of our cognitions of past, present and future. To apply the conditions we divide time into days, months and years etc. Kala is boundless extent. It is two-asserted and three-dimensional. We divide time into hours, minutes, and seconds for our own needs. Kala or time such as space is an important concept in philosophy and physics. Space is also needed to describe any event. It is difficult to get a clear idea of an event without knowing when it happened. Sthana and kala are different dravya or substance.

The following figure is a clock which measures time.

Fig. 40

The following figure is two- asserted time.

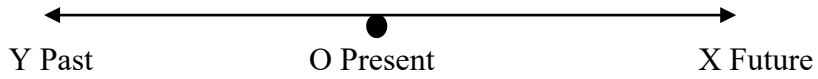

Fig. 41

The following figure is three-dimensional time.

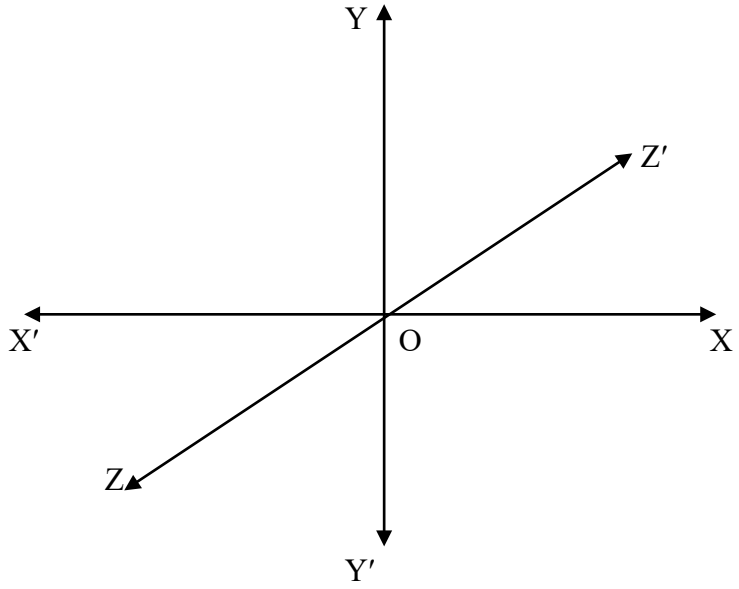

Fig. 42

Now from the decision 4

We get force, mass, space and time follow the cross rule. Quantity is related to these (force, mass, space and time).

ঐ৩(Quantity) ↘ ত(Force) ⇒ থ(Mass) ⇒ দ(Space) ⇒ ধ(Time)

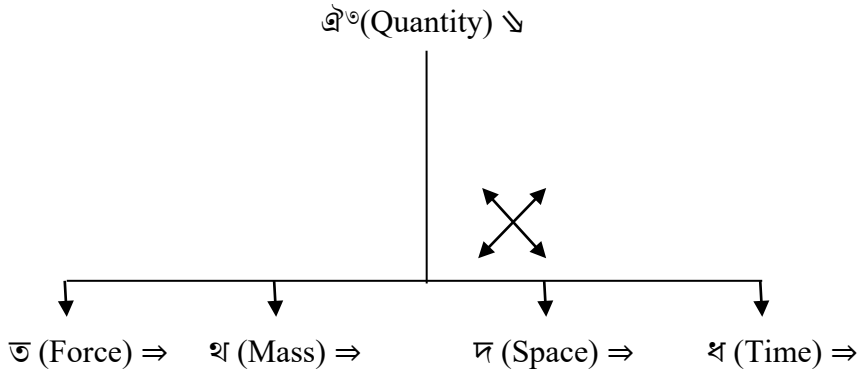

Fig. 43

We get six laws from cross rules.

Law 4.1 Keeping ত (Force) and থ (Mass) constant, দ (Space) is directly proportional to ধ (Time), i. e.,

দ (Space) ∝ ধ (Time)

Law 4.2 Keeping ত (Force) and দ (Space) constant, থ (Mass) is directly proportional to ধ (Time), i. e.,

থ (Mass) ∝ ধ (Time)

Law 4.3 Keeping ত (Force) and ধ (Time) constant, থ (Mass) is inversely proportional to দ (Space), i. e.,

থ (Mass) ∝ 1/ দ (Space)

Law 4.4 Keeping থ (Mass) and দ (Space) constant, ত (Force) is inversely proportional to ধ (Time), i. e.,

ত (Force) ∝ 1/ ধ (Time)

Law 4.5 Keeping থ (Mass) and ধ (Time) constant, ত (Force) is directly proportional to দ (Space), i. e.,

ত (Force) ∝ দ (Space)

Law 4.6 Keeping দ (Space) and ধ (Time) constant, ত (Force) is directly proportional to থ (Mass), i. e.,

ত (Force) ∝ থ (Mass)

Now from the decision 5

We get category, assertion, dimension and quantity are related. Jnana is the cause of these (category, assertion, dimension and quantity).

ই(Jnana) ⇓এ (Category) ↘ এ৩ (Assertion) ↘ এ (Dimension) ↘ এ৩(Quantity)↘

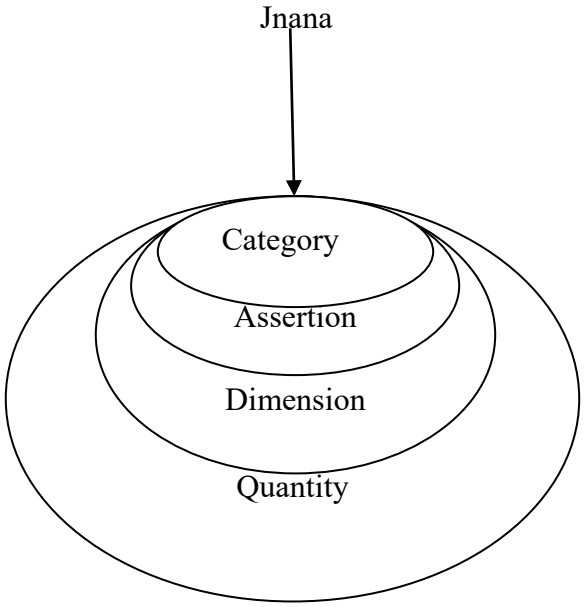

Fig. 44

10. Conclusion

This universe or jagat is the magical development of Brahman. Brahman is true, so everything in this universe is true. The Purusa Sukta mentions, '**S**a bhumim vishvato vritva atyatishthad dhashangulam.' That is He (Purusa) has enveloped this universe from all sides and has (even) transcended it by ten angulas or inches. In the Upanishads He who is Brahman, in the Samhita (Rigveda Samhita) He is Purusa. Purusha, Brahman, Jagat are all true. But due to lack of proper knowledge we cannot realize these. It is a matter of acquiring proper knowledge. We tell the truth as much as we can, and we tell the false as much as we cannot. Mathematically the topic has been presented.

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