CHAPTER I

The Problem

When I was first introduced with the Aristotelian logic, at the initial stage, I could not understand the difference between the sentence and a logical proposition. Out of the five forms of grammatical sentences, only affirmative and negative sentences were regarded similar to, logical proposition. Rest of the forms of sentences were required to be transformed into their logical forms, if one wanted to use them logically. I could not understand why this difference was made between affirmative and negative sentences on one hand, and the rest of the sentences on the other. Later on, I came to know that in a proposition some thing was either affirmed or denied about the subject. It was also brought to my notice that a proposition is a statement of Relation between the subject and the predicate; the two basic constituents of a proposition. The sign of a relation is known as copula. Copula therefore binds together the subject and predicate of the logical proposition into some sort of relationships.

From Bradley's logic, it was clear to me that, "to think is to judge and to judge is to relate, and to relate is to use a criterion".¹ This shows that the entire body of knowledge termed as 'logic' is centred round some sort of the concept of relation.

¹ Bradley P.H. Essays ...
From proposition when I went further to the classification of propositions in Aristotelian logic, I came to know that the entire theory of classification of propositions in Aristotelian logic is based upon quality, quantity, relation and Modality, and Aristotelian classification of proposition in the categorical, Hypothetical and disjunctive involves this theory of relation.

The method by which in Aristotelian logic inferences are drawn and the validity of the inferences drawn is decided, involves the theory of relation. Even with regard to scientific method advocated in induction it is found essentially based upon theory of relation.

When I was busy learning mathematical logic it became cleared to me that the whole system of logic is based upon two types of theories of relations. Whoever reads Russell, will be convinced that Russell was highly dissatisfied with Aristotelian logic. He wanted to dispense with Aristotle's logic which according to him, was based upon the theory of Internal Relation and it was because of this, that it led to monism in epistemology. As a Realist and as a scientist Russell wanted to invent a logic which could do away with monism on one hand and justify pluralism on the other hand.

2. See Russell, Inquiry into Meaning and truth
He therefore started his experiments in logic. As a mathematician he knew that the entire system of mathematics was based upon theory of External Relation and that it is possible to reduce logic to some sort of mathematics of calculus by combining the notions of both traditional logic and the mathematics.

It is a matter of common sense that his efforts have failed and that he arrived at some paradoxes, the solution to which no system of logic leads.

He therefore discontinued his efforts at transforming logic into mathematics. No other efforts at resolving mathematical paradoxes have as yet been traced, though number of astute thinkers have devoted themselves to this task for number of years. Even Frege has admitted in his The Ground work on the foundations of Arithmetic that he has failed to trace solution to some of the problems which Arithmetic posed to him.\(^3\)

A Ray of hope was raised into my mind when I happened to be acquainted with theory of Relation in Navya Nyaya logic of Indian Philosophy, to which we shall make reference when we turn to constructive part of this thesis. We shall proceed to take stock of Aristotelian logic in first two chapters.

\(^3\) Frege: Ground work of Arithmetic....
Then we shall turn to Russell's experiments with logic and mathematics in the third chapter. Our fourth chapter of this work will be devoted to theory of Relation on which symbolic logic or mathematical logic is based. In the fifth chapter we shall arrive at some conclusions distilled out of our critical examination of both the theories based upon Internal and External Relations.

In the second part of the thesis, the first chapter will be devoted to comparative study of all the three systems of logic i.e. Aristotelian logic, Russelian or Symbolic logic and the logic of Navya Nyāya in Indian Philosophy.

We shall examine, in detail the problem of Vyāpti as examined by Indian thinkers like Raghunāth, Gangesh Upādhyāy, Jagdish and others. We shall propose in the last chapter Navya Nyāya theory of Relation as proposing solution to some of the problems of modern logic which Russell and others have failed to reconcile.

In the conclusion we shall explain how Navya Nyāya theory of Relation strikes at the very roots of the problems of modern logic and how it leads to the solutions of the paradoxes to which Frege and Russell arrived at we shall also indicate the limitations of logic as a method of acquiring knowledge.
We think and believe firmly that the solution of the problems of theory of knowledge lies, in this direction and this direction only. This being an exploratory effort nothing more be expected from us.

The thesis contributes to the advancement of knowledge on the following points:

(1) That it scrutinizes the problems of Logic based upon the Theory of Internal Relation and the new logical theory based upon External Relation.

(2) It seeks the synthesis of Western Systems of Logic with the logical theories of India i.e. Nyāya and Nyāya Nyāya.

(3) It, thereby suggests the direction into which the solution of the paradoxes of modern logic lies.

We want to express here our gratitude to my guide Dr. J.J. Shukla, Reader, Department of Philosophy, Gujarat University for his constant encouragement to work on such a subject like this. But for his guidance the work would have remained incomplete. We also thank here, all those great thinkers who have contributed in the advancement of Logic by their works indicated in the footnotes below.

We express our thanks to my sister Hanisha P. Patel for helping me in preparing manuscript for the press. I express my gratitude to my wife Smt. Mukta V. Patel for encouraging me to complete the work.

V.K. Patel
Aristotle defined man as a 'rational animal'. The rationality of man consists in reflection; to reflect is to think, and to think is to judge, and to judge is to arrive at a conclusion. In ordinary course we do think but we think logically or not is a matter of reflection. Logical thinking, thus differs from ordinary activity of mind in which the mind moves from one object to another object, whatever comes across his eyes and which occupies his attention. Every passing thought occupies his attention but the mind does not rest on the object except for a while. Ordinary thinking in which object occupies central position is not reflective thinking. According to Miss L.S. Stebbing reflective thinking is a purposive activity which starts with an actual problem. Natural activity of the mind, no doubt, but is not habitual as it is undertaken with a view to solve the problem. It has therefore a natural goal i.e. the solution of the problem.

To reflect is a lesson which even the child has to know. In this activity the child has to attend and distinguish, he has to
join adjectives. This rule is an universal and the child has to see that the particular adepts, itself to this universal. The relation of the universal to the particular or the adjective to the substantive forms thus the subject matter of reflective thinking.

The end is to achieve a result. In solving a theoretical problem one has to think and to apply an universal rule to the problem in hand. He has therefore to ponder, which is the best way to secure the result. The result or the end represents the universal or the governing principle, which governs our selection of the means and instruments, whose action we have to regulate in conformity with the end. Even in the matters of conduct, reflection is active but to reflect here means to recollect the right, the duty-the universal, which serves as a fixed rule to guide our behaviour in a given situation. Our particular act or behaviour implies recognition of universal law. Even in our study of Natural Phenomena, e.g. thunder and lightning, eventhough we are familiar with the phenomena and eventhough we perceive it very often, we are not content with the bare acquaintance of the phenomena, or with the fact as it appears to the senses. We would like to go behind the surface to know what it is and to comprehend it. This leads us to reflect to find out the cause as something different from the mere phenomena. We try to know the distinction between the inside
and outside or the force and its manifestation into cause and the effect we again once more find the inside or the force identified with the universal and the permanent.

We do not deal with this or that instant of flesh of lightning. We want to find out that which continues the same in all cases of lightning. The sensible appearance of lightning is individual and evanescent. We have to find out the permanent in it by reflection. Nature presents with countless number of individual forms of phenomena. In this variety we feel the need of introducing unity. We therefore compare and consequently find out universal in each single case. The individuals are born and parish while species abides and recurs in them all. Its existence is only visible to reflection. All the laws either of nature or of the human behaviour fall under reflection. Even the heavenly bodies are regulated by such laws, which we find out by reflection. It is said that Solon produced out of his head the laws he gave to Athenians. Such laws, because they are the products of somebody's mind are not merely subjective. In fact, they are the true objective being of things. To find out such laws we must call in the action our own faculties to transform what is immediately before us.
1. Logic as a Reflective Thinking

As a reflective thinking logic transforms what is immediately given. This looks like an inversion of the natural order on which knowledge is based. It is the conviction that the only way of reaching the permanent subsystem is to transform the given phenomenon by means of reflection, only the critical realist have raised doubt with regards to this conviction by making difference between the products of thought and the things in their own nature. It is said that the real nature of things is different from what we make out of them. Thus, a distinction is made between thought and thing. It is maintained that they are diversely opposed to each other and that we know all about the phenomenon, but not of the nature of object as such. It is reflective thinking which reminds us that there is some sort of identity between thought and a thing. In other words there is relation of identity between the word and the object.

This fact has again been emphasized by followers of He was in search of identity between the language and that which is pictured by the language. In fact this is the problem with which most of the contemporary thinkers are occupied. It is a question of pertaining to the nature of thought and things, one of the most outstanding problems of ancient as well as mediaval times. Our natural languages so long as they remain natural can not depict the nature of reality. They must be transformed by reflection and
brought in harmony with the nature of objects with which logic
deals as a reflective thinking, they must evolve its own language
or terminology. It also should work out its own etymology or the
principles governing the discourse, without which no meaningful
utterance can be understood. The problem of meaning can only be
decided with reference to etymology of the words comprised
under a language which ceases to be natural and which becomes an
effective tool for conducting an effective philosophical discourse.

2. Reflective Thinking as a Theory of Relation:

To reflect is to relate, a piece of thinking with the
nature of things. Thus the whole of logic can be reduced to the
theory of relations between the thought on one hand and nature of
things, on the other hand. It would be in the fitness of things,
if we examine the entire output of logical thought of our era with
a view to locate the roots of the problem faced by contemporary
thinkers. We should therefore thoroughly examine first of all the
Aristotelian logic as it has come down to us.

3. The Theory of Internal Relation:

To speak of thought as the heart and soul of the world, may
seem to be ascribing consciousness to the things of nature. As
a matter of fact the real nature of object is brought light by
reflection. Reflection is an act of mind in which we think
thought over again. It is "Thinking study of things in general" or the study of Being qua Being. It is also construed as reflection on the first principles of nature of things.

In whatever way it may be described, it is clear from this that this exertion of thought is an act of every mind and therefore the real nature of things revealed to me, is a product of my mind in its character of thinking subject—generated by me in my simple universality, self corrected and removed exteraneous influences. In one word, in my freedom. No man can think for another any more than he can eat or drink for another. To think is to be free Ipso facto, thought as the action of the universal is abstract relating to self to self. Being at home with ourselves, our consciousness is, so far as its content is concerned, in the fact and its characteristics. It is easy to appreciate the fact that thought is only true in proportion as it is seen itself in the fact; and in point of form, it is not something private particular rule or act of subject but rather is an attitude of the consciousness in which the self, free from all the special limitations to which it is liable, restricts itself to that universal in which it is identical with all individuals. Aristotle has summoned the mind to rise to the dignity of that attitude which is won by sinking all our individual opinions by submitting to the survey of the fact.

4. Hegel's Logic
5. Aristotle's Metaphysics
4. The Relation of Thought and Things :

Thus defined, so long as the form is concerned as is being discussed in common logic, logic turns out to be a theory of relation among thought forms. Coinciding with theory of relations of things in Metaphysics - the science of things set and held in thought. Thoughts are essence of the reality of things. Logic thus becomes the reality of the essence of things comprehended, in thought forms. It is different from metaphysics in its content which is thought form as also its fields of study, which is strictly limited to the sphere of essence of things comprehended in thought. It is an exposition of the relation in which such thought forms as judgement, proposition, syllogism, stand to other such as causality etc.

Reflection brings out the universal of things which forms one of the constituent factors of judgement. It is generally believed that thought is usually confined to express what belongs to the mind or the consciousness only. But this is half of the story for every judgement has invariably an objective constituent i.e. its reference to something outside itself. Every judgement thus forms the very heart and soul of the objective world but it does not mean ascribing consciousness to the things of nature. Shelling and many others have committed the fallacy of making thought the inward function of things by calling nature, 'Petrified reason'. Instead it would be better to prevent misconception to

6. Shelling
call thought forms as in Aristotelian terminology categories 7.

5. The Principles of Traditional Logic:

Categories, as thoughtforms containing the essence of the objective world, unless systematised completely and reduced to fewest possible principles cannot be a science. The principles of logic are to be sought in a system of fundamental categories embodied in to universal judgements.

The other faculties of mind such as perception, conception and will, are all guided by the faculty of thought. Thought, therefore, is the constitutive substance of external things. It is also the universal substance of what is spiritual. In all human perception, thought is present so also thought is the universal in all acts of conception and recollection. Thought is present in every mental activity like willing, wishing, inferring as well as reproduction. All other faculties are only further specialisation of thought. Principles of thought or logic are to be sought in thought types or fundamental categories in which the opposition between the subject and the object, in its usual sense, vanishes or disappears. It is therefore contended by Ancients that 'Reason governs the world'8.

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7. See Logic by Hegel: Oxford Uni. Press
8. History of Greek Philosophy - Guthrie
That is an immanent principle and also the most proper end in world or nature of things. It is universal among things and the systematic structure of such thought types or categories is the subject matter of logic. The study of such structure of thought types can be reduced to theory of Relations.

6. Three types of Theories of Relations:

(1) The theory of Internal Relations on which the entire theory of Aristotelian logic is based.

(2) Theory of External Relations on which modern logic and its important counterpart—symbolic or mathematical logic is based.

(3) Theory of Relations as is worked out by Navya Nyaya thinkers of ancient and medieval India.

We shall now examine the theory of Internal Relation of Aristotelian Logic.

7. Theory of Proposition in Aristotle:

The definition of proposition as is given by Aristotle is that it is a statement of Relation between the subject and predicate. As a statement of relation, proposition either affirms or denies the relation of predicate with subject. It was believed that predicate is implicitly contained in the subject e.g.
All men are mortal.

In this proposition mortality is affirmed of the subject 'All men' while bringing in the predicate as affirmed of the subject in proposition or propositional form; what was implicitly contained was brought out and affirmed of the subject. The predicate, therefore, is not something new, but which was already contained in the subject. The proposition simply affirms of the relation between the subject and the predicate.

In the proposition, 'All men are not immortal', immortality is denied of the subject. The proposition, therefore, is a statement of denial of the relation between the subject and the predicate. In an affirmative proposition or statement the predicate which was contained in the subject as part and parcel of the definition of the subject was brought out and related to the subject. Thus, the definition of proposition in Aristotelian logic is based upon theory of Internal relation between the subject and the predicate, as the predicate formed part of the definition of the subject. Similarly, the predicate is defined as, that which is affirmed of the subject. Had there been no relation between the subject and predicate, it would not have been possible to define the predicate. The definition of predicate therefore is based upon the theory of Internal relation.
8. **Classification of Propositions in Aristotle**:  

Aristotle has classified propositions into three groups:

1. **Categorical Propositions**
2. **Hypothetical Propositions**
3. **Disjunctive Propositions**

1. **Categorical Proposition**:

In a Categorical Proposition, the relation between subject and predicate is clearly stated. In other words, a categorical proposition is a statement of relation, either affirmative or negative, between the subject and the predicate. If the relation of predicate with the subject affirms the predicate of the subject, the proposition is termed affirmative and if the predicate is denied of the subject, the proposition is termed as negative.

Rest of the types of the sentences like exclamatory, Interrogative etc. are required to be reduced to their categorical forms, if they are to be used as logical propositions. This means that Aristotelian logic recognises only that form of proposition, which states a relation between subject and predicate either affirmatively or negatively.
2. **Hypothetical Proposition**: 

This is the form of proposition in which two propositions are related to one another in such a way that the one is implied by the other. It is known as a relation of implication in which affirmation or the denial of the one constituent of the proposition determines the truth and falsity of the whole proposition. The relation of implication between two propositions joined by 'if - than - ', if it is genuine, follows some rules for example,

- It is cloudy
- It may rain

In this example the affirmation of the antecedent leads to the affirmation of the consequent; but whenever there is a case of negation, the denial of the consequent amounts to the denial of antecedent or the consequent determines the truth or falsity of the entire proposition of the implication form.

3. **Disjunctive Proposition**: 

In a strong disjunctive proposition either affirmation or the denial of one the disjuncts affirms or denies the other alternative. There is therefore, in disjunctive proposition a relation of alternation. In weak disjunctive proposition either the denial or the affirmation of one of the disjuncts leaves open the possibility of third alternative if there be any. Thus the disjunctive proposition
is a proposition which is a statement of the relation between two or more alternatives, the affirmation or the denial of one of the disjuncts leads to the affirmation or denial of the second alternative or the possibility of third alternative if there be any.

9. Categorical Propositions and Classes:

When we talk in terms of categorical proposition as a statement of relation between the subject and the predicate of a proposition, we treat the subject and the predicate of categorical proposition as a class.

A class is the collection of objects which have some specified characteristic in common, there may be various ways in which classes are related to each other. If every member of one class has specified characteristic common to all members then it is termed as a class. If every member of one class is also a member of second class then the first class is said to be included or contained into second class. If, on the contrary, some members of one class are members of another, then the first may be said to be partially contained in the second.

There are pairs of classes having no members in common such as the class of all circles. This various different relationships between classes are affirmed or denied by categorical proposition.
10. Forms of Categorical Proposition in Aristotelian Logic:

In Aristotelian logic there are four standard forms of categorical proposition recognised i.e.,

1. Universal Affirmative 'A'
2. Universal Negative 'E'
3. Particular Affirmative 'I'
4. Particular Negative 'O'

1. Universal Affirmative:

This standard form of categorical proposition asserts a relation between two classes e.g.,

'All Politician are liars'

There is a class of politician and the class of liars, in the above example, first class is included or contained in the second and means that every members of the first class is the members of the second class. There is, therefore, in universal affirmative proposition the predicate term contained in the subject term or subject is wider class in which the predicate term as a class inclusion hold between the two classes and that inclusion is complete or universal i.e., All members of one class(%) are said to be the members of the class p.
2. **Universal Negative Proposition**:

Universal negative proposition derives relationship between two classes, for example, 'No politicians are liars'. In universal negative proposition the class of the politicians have no relation universally with the class of liars. There is therefore in universal negative proposition the relation between the politician as a class and liars as a class denied. Thus universal affirmative or negative propositions are purely relational. Similarly in particular affirmative and particular negative propositions also the relation between the subject and the predicate is either affirmed or denied. They are also, therefore relational.

Not only this, but inter relation between universal affirmative and particular negative i.e., the relation of contradiction and that between universal negative and particular affirmative as well as the relation between universal affirmative and particular affirmative, universal negative and particular negative being subalterns have the relation of contradiction, contrary or subaltern relation. The traditional square of opposition of proposition represents relation among four types of propositions in Aristotle.