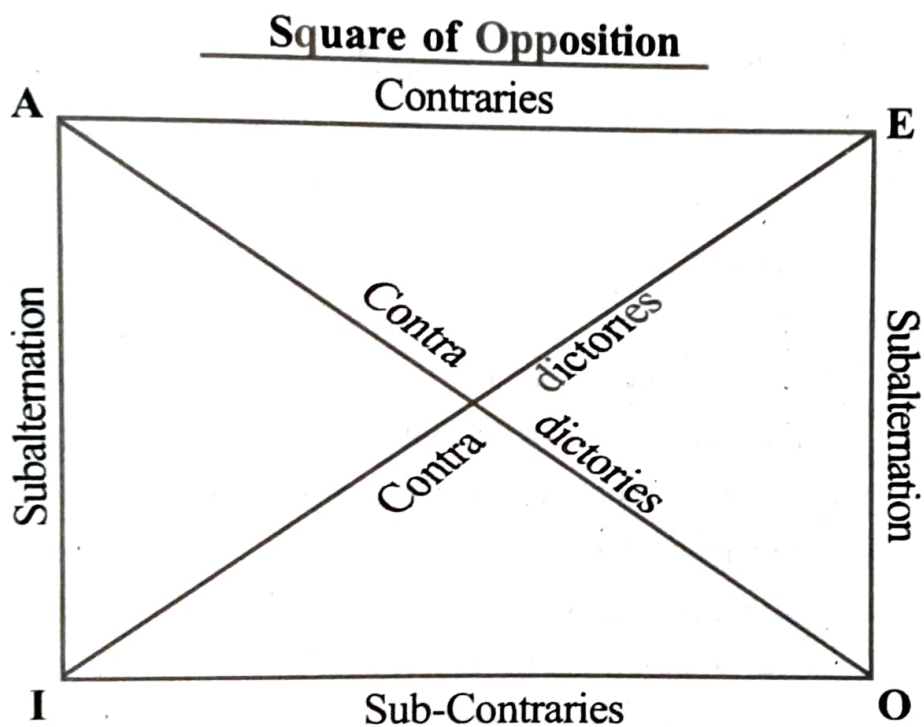


• Square of Opposition

There are thus four kinds of oppositions between the two categorical propositions—contradictories, contraries, sub-contraries and sub-alternation. These are represented using an important and widely used diagram called the square of opposition. In other words, the relation among the four categorical propositions is explained by a diagram called the 'Square of Opposition,' "The logical relation that exists between two contradictories, between two contraries, or in general between any two categorical propositions that differ in quantity, quality, or other respects. These relations are displayed on the square of opposition."¹ Traditional square of opposition is an arrangement of lines that illustrates logically necessary relations among the four kinds of categorical propositions. The traditional square is represented as follows :



In this diagram, the universal propositions, i.e. A and E propositions are placed at the top, the particular propositions, i.e. I and O propositions are placed at the bottom, the affirmative propositions, i.e. A and I propositions on the left and the negative propositions, i.e. E and O propositions on the right. In this diagram, it is seen that A and E propositions exhibit the relation of contrary oppositions; I and O propositions exhibit the relation of sub-contrary oppositions; A and I propositions exhibit the relation of sub-alternation, E and O also represent the same relation; and A and O propositions exhibit the relation of contradictory opposition, similarly E and I also exhibit the relation of contradictory opposition.

Aristotle, the father of logic, did not recognize four kinds of oppositions. For him, there are only two kinds of oppositions—contradictories and contraries. He refused to accept sub-contraries and sub-alternation as oppositions. According to Aristotle, sub-contraries and sub-alternation are not the oppositions at all. Because, he accepts the term 'opposition' in general sense. In this sense, opposition means any two propositions that cannot be true or false at the same time, if one is true another must be false. But in the case of sub-contraries, A and I or E and O propositions can be true at the same time. When universal proposition is true, the particular must be true. For example,

- (a) A— All students are men
I— Some students are men
- (b) E— No men are perfect
O— Some men are not perfect

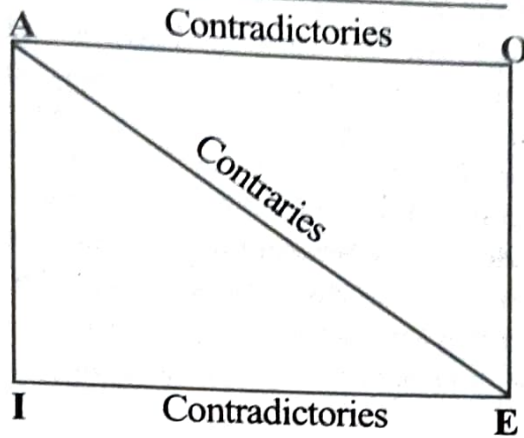
In these two examples, it seems that there are sub-contrary oppositions. But if we observe these two propositions, then it is seen that both the pairs (AI and EO) can be true at the same time. If 'All students are men' is true, then 'Some students are men' is also true; again, if 'No men are perfect' is true then 'Some men are not perfect' is also true. Therefore, since AI and EO can be true at the same time, there is no such relation called sub-contrary opposition.

Similarly, Aristotle did not accept sub-alternation as opposition, because in that case, the two propositions having the relation of sub-alternation can be true at the same time. Sub-alternation opposition is not recognized because sometimes an I proposition and an O proposition may both be true. For example,

- I— Some men are honest
- O— Some men are not honest

In this case, the I proposition and the O proposition both are true. Because, the proposition 'Some men are honest' and 'Some men are not honest' are both true. Therefore, the relation between I and O propositions cannot be the opposition of sub-alternation. Thus, according to Aristotle, opposition necessarily means that both the propositions cannot be true at the same time.¹ Aristotle only recognizes contrary and contradictory oppositions. Thus Aristotle gives the following representation of the square of opposition :

Aristotle's Square of Opposition



In this diagram, it is seen that there are contradictory oppositions between A and O propositions and between I and E propositions. On the other hand, the diagram shows that there is a contrary opposition between A and E propositions. In Aristotle's square, Contrary Opposition is recognized by the diagonal line, the Contradictory Opposition by the lines by aids of the square.

1. Bhol Nath Roy, *Deductive Logic*, p. 141.