SEMESTER 4

Mill's Methods

In the early 19th century, the philosopher John Stuart Mill identified the following four (or five) informal methods for establishing causal connections between types of events.

1.The Method of Agreement:

2.The Method of Difference

3. The Joint Method

4. The Method of Residues

5.. The Method of Concomitant Variations

The Method of Agreement:

Definition of method of agreement. : a method of scientific induction devised by J. S. Mill according to which if two or more instances of a phenomenon under investigation have only a single circumstance in common the circumstance in which all the instances agree is the cause or effect of the phenomenon.

For example, consider an individual doing research on why some students are successful in an especially difficult subject, say, mathematical logic. In reviewing the data, the researcher finds many circumstances in which students are successful in mathematical logic, such as instructors using particular approaches to teaching the subject or assigning particular tests. However, the researcher discovers that in all instances in which students are successful they are highly motivated.

The Method of Difference

A method of scientific induction devised by J. S. Mill according to which if an instance in which the phenomenon under investigation occurs and an instance in which it does not occur have each circumstance except one in common, that one occurring only in the former, the circumstance in which the two instances differ is the effect or cause or necessary part of the cause of the phenomenon.

In the previous example suppose that none of the students became ill except for the one who ate pumpkin pie for dessert. She had eaten the appetizer and the main course just as the other students did who did not become ill. • Prior factors Effect a, c, e, f, h no illness occurred a, d, e, g, i no illness occurred b, d, e, f, h no illness occurred b, c, e, g, j illness occurred Therefore j is the cause.

The Joint Method

A combination of the methods of agreement and difference

If two or more instances in which the phenomenon occurs have only one circumstance in common, while two or more instances in which it does not occur have nothing in common save the absence of that circumstance; the circumstance in which alone the two sets of instances differ, is the effect, or cause, or a necessary part of the cause, of the phenomenon

Also called simply the "joint method, " this principle simply represents the application of the methods of agreement and difference.

Symbolically, the Joint method of agreement and difference can be represented as:

A B C occur together with x y z

A D E occur together with x v w also B C occur with y z

Therefore A is the cause, or the effect, or a part of the cause of x.

The Method of Residues.

Subduct from any phenomenon such part as is known by previous inductions to be the effect of certain antecedents, and the residue of the phenomenon is the effect of the remaining antecedents.

Symbolically, the Method of Residue can be represented as:

A B C occur together with x y z

B is known to be the cause of y

C is known to be the cause of z

Therefore A is the cause or effect of x.

Method of concomitant variations.

Whatever phenomenon varies in any manner whenever another phenomenon varies in some particular manner, is either a cause or an effect of that phenomenon, or is connected with it through some fact of causation.

If across a range of circumstances leading to a phenomenon, some property of the phenomenon varies in tandem with some factor existing in the circumstances, then the phenomenon can be associated with that factor. For instance, suppose that various samples of water, each containing both salt and lead, were found to be toxic. If the level of toxicity varied in tandem with the level of lead, one could attribute the toxicity to the presence of lead.

Symbolically, the method of concomitant variation can be represented as (with ± representing a shift):

A B C occur together with x y z

A± B C results in x± y z.

Therefore A and x are causally connected

Unlike the preceding four inductive methods, the method of concomitant variation doesn't involve the elimination of any circumstance. Changing the magnitude of one factor results in the change in the magnitude of another factor