

THE EXPERIMENTAL METHODS OF INVESTIGATION.—DR. RAND introduced to the Institute PROFESSOR THOMAS HARRISON, LL. D., who had cheerfully responded to his invitation to address the Institute on the *Experimental Methods of Investigation*.

The general question which the lecturer proposed to answer was this :—What are the available instruments of the human mind for the advancement of knowledge? In discussing this question, DR. HARRISON disclaimed any desire to be considered original, declaring his object to be simply to lay before his hearers what he judged to be the best that had been thought and written on the subject.

Some of the instruments referred to were, he said, so familiar, that he would only mention them in summing up at the close; but with the Five Experimental Methods of Investigation, few probably were so well acquainted. The importance now attached to them was mainly due to the influence of JOHN STUART MILL.

After speaking of the necessity for careful observation aided by experiment, and pointing out some of the common fallacies of observation, he went on to discuss his main subject—the Five Experimental Methods of Investigation. These were stated as follows :—

I.—THE METHOD OF AGREEMENT.

Canon—If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstance in which alone all the instances agree may be regarded, with more or less of probability, as the cause (or effect) of the given phenomenon, or, at least, as connected with it through some fact of causation.

II.—THE METHOD OF DIFFERENCE.

Canon—If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former; the circumstance in which alone the two instances differ, is the effect, or cause, or a necessary part of the cause, of the phenomenon.

III.—THE METHOD OF CONCOMITANT VARIATIONS.

Canon—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.

IV.—THE DOUBLE METHOD OF AGREEMENT.

Canon—If two or more instances in which the phenomenon occurs have only one other circumstance in common, while two or more instances from which the phenomenon is absent 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. Moreover (supposing the requirements of the Method to be rigorously fulfilled), the circumstance proved by the Method to be the cause is the *only* cause of the phenomenon.

V.—THE METHOD OF RESIDUES.

Canon—Subtract 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.

As a means of deducing the first four principles and also as an illustration of their application, DR. HARRISON outlined the theoretical mode of procedure in investigating the phenomena of Dew, with the results of such investigation.