

It must ultimately stop at a proposition whose universality will have to be guaranteed not by going back in the like manner, but by reference to actual facts, *ie.*, by Induction. Thus, the ultimate universal major premise of a chain of deductive reasoning is established by Induction.

To sum up : Deduction accepts universal premises as true without challenge or proof, regardless of whether they are in harmony with outer reality or not, while Induction seeks to prove their universality and material truth. Hence a need for Induction.

### What are the Essential Characteristics of Induction?

It is clear from what has been said above that Induction arrives at universal real propositions through observation of particular facts. For example, I observe that my dog is faithful, your dog is faithful, his dog is faithful. From these particular observations, I infer the general proposition "All dogs are faithful" This is an instance of inductive reasoning. *Induction, therefore, is the process of inferring universal propositions from particular facts.* Starting from individual cases, it goes to general laws. In other words, it goes from *some* to *all*. From what is mentioned here, we may note the following essential marks of Induction :—

Induction must establish a *proposition* as opposed to a *notion* or term. A notion expresses a single idea or quality, while a proposition expresses a relation or connection between two notions or terms. "Man", "black", etc., are notions ;

while "Man is mortal", "Crows are black", "Lions are fierce", "Triangles are not circles", etc., are propositions which express a relation of agreement or disagreement between two notions or terms.

(a) But we must remember that the proposition which is established by Induction must be a real and not merely a verbal proposition.

(b) The proposition established by Induction must also be *General* or *Universal*. "Some men are mortal", "some crows are black", "some lions are fierce", etc., are not *general propositions*; while "All men are mortal," "All crows are black," "All lions are fierce," etc., are *general or universal propositions*. A universal proposition is one in which the predicate is affirmed or denied of every instance denoted by the subject - a reference is made to the whole of the subject. Thus, starting from individual cases, Induction must arrive at general propositions. We observe a few instances while the conclusion covers all similar cases. To illustrate, after observing that *A* is mortal, *B* is mortal, *C* is mortal, we infer that all men are mortal. This process of going from particular cases to general propositions is called *Generalization*, and involves what is called the "Inductive Leap." The inductive leap consists in going from what is observed to what is not observed. When, for example, we say that all men are mortal, we refer not only to those men who have been observed but also to those who have not been observed and who possibly can never be observed. Similarly, when we conclude that all material bodies fall

to the ground, we generalize from *some* known instances. The inductive leap, therefore, consists in passing from the cases which have been observed to all similar cases, embracing the past, the present and the future, the near and the distant, the known and the unknown. Though risky, the inductive leap is essential, and Induction can never be complete without it.

② Secondly, Induction must be based on *observation of facts*. We have seen that material truth or agreement with facts is the aim of Induction, and this aim can be fulfilled only by observation of facts. Thus, for example, the general proposition, "All men are mortal," is based on our observation of particular cases of death of persons we have come across.

③ Thirdly, Induction must be based on *causal connections* among facts. A generalization which is not based on causal connections cannot be accepted as valid. If, for example, the generalization "All crows are black" is based only on some observed cases of black crows, it cannot be regarded as valid. It can be accepted as valid only if a causal connection between "crownness" and "blackness" is proved. Similarly, the generalization, "All red mangoes are sweet," cannot be accepted as a valid induction unless a causal connection between "redness" and "sweetness" of mangoes is shown.

### ✓ Comparison of Induction with Deduction

We may note the following points of difference between Induction and Deduction :—

We have read that in deductive reasoning