CHAPTER III

GENERALIZATION

What is Generalization ?

We have seen that Induction is based on facts. But it is not complete unless it generalizes from those facts. Beginning with particular facts, Induction must arrive at universal propositions. These universal propositions, based on particular facts, are called Generalizations. For example, I see that a particular stone, if unsupported, falls to the ground. This is a particular fact from which I generalize that *all* stones fall to the ground, or that *all* material bodies fall to the ground. I observe a number of Europeans and find that they are white. From these particular observations I generalize that *all* Europeans are white. Thus, to generalize means to infer universal propositions from individual cases. It consists in going from the particular to the general, from the individual to the universal, from "some" to "all".

Generalization is one of the essentials of Induction. According to Mill, Induction is complete only at the stage of generalization.

Kinds of Generalization

Generalization may be *Scientific* or *Empirical*.

Scientific Generalization.—A Scientific Generalization is based on the discovery of causal connections among facts. If our generalisation,—all ruminants (animals that chew their cud) are

cloven-footed—is based on a causal connection between "*ruminancy*" and "*cloven footedness*," it will be a scientific or valid generalization. Similarly, if the generalization,—All Europeans are white—is based on a causal connection between "*Europeanness*" and "*whiteness*," it will be a scientific or valid generalization. Sometimes we generalize hastily, without verifying whether there is any causal ground for generalizing or not. For instance, a newcomer in a certain town, on coming across only dishonest persons, may generalize that *all* the inhabitants of the town are dishonest. In a hasty generalization, no causal connection is discovered among facts. It is, as it were, a leap without looking.

Empirical Generalization

An Empirical Generalization is not based on causal connections but on the evidence of experience. We find that two facts are always conjoined, and we generalize on the basis of their uniform conjunction. An Empirical Generalization does not tell us *why* the two facts are so conjoined. We find that, *so far as our experience* goes, the red colour of a mango and its sweetness always go together, that rain always follows a dust-storm, that ruminants are always cloven-footed, that white tom-cats with blue eyes are always deaf. But we do not know *why*. If in the abovementioned generalizations, no causal connections are discovered among facts, they will be called Empirical Generalizations. Hence, an Empirical Generalization is a generalization

established not on the basis of causal connections but on the basis of experience.

Basis of Generalization

Generalization consists in going from particular facts to general laws, from "some" to "all". Now, the question arises : How are we justified in inferring something about a whole class after observing a few individuals of that class ? On what ground do we hold that what is true of "some" is true of "all" ? We see a particular burning process of fire, and from this we generalize that fire *always* burns. We see water flowing downwards, and from this particular observation we generalize that water *always* flows downwards. We see that an apple falls to the ground, and from this we infer that *all* material bodies, if unsupported, fall to the ground. Now, it is quite clear that if fire sometimes burnt and sometimes did not, if water sometimes flowed downwards and sometimes upwards, if material bodies sometimes fell to the ground and sometimes soared to the sky, we would not be able to generalize about them. We can generalize about the facts of Nature only if they behave in a uniform manner. If Nature had not been uniform and events could jump out of nothing without any cause, like Jack in the Box, generalization would be impossible. Our generalizations are based on the belief that in Nature every effect must have a cause and that the same cause must always produce the same effect. *Thus, we generalize on the evidence of particular instances, depending upon the principles of Causation and Uniformity of Nature.*

Moreover, generalization would be impossible if the various facts of Nature were unconnected. We can pass from "some" to "all" only because Nature is a system, a whole of inter-related parts. Hence, the unity of Nature is the basis of generalization.

Generalization and Perfect Induction

We have seen that Perfect Induction is merely a summary of particular observations and does not go beyond them. Generalization, on the contrary, goes from the particular to the general, from the observed to the unobserved, from "some" to "all". In other words, it involves the inductive leap which is not to be found in Perfect Induction. In Perfect Induction, we arrive at a general proposition after enumerating all the particulars coming within its sweep. Hence, it possesses no scientific value because it lacks one fundamental condition of induction, namely, the inductive leap, a going from "some" to "all".

SUMMARY

Generalization is one of the essentials of Induction. Induction is complete only at the stage of generalization. Generalization means inferring universal propositions from particular instances. It consists in going from the particular to the universal, from the individual to the general, from some to all I see one black crow, and another, still another, yet another, and from these particular observations I infer the universal proposition that all crows are black. This is Generalization.

Kinds of Generalization.—Generalization is of two kinds, *Scientific* and *Empirical*. A scientific generalization is based on the evidence of causal connections, while an empirical generalization is based on the evidence of experience. If our generalization " All crows are black ' is based on a causal connection between crowness and blackness, it would be a scientific or valid generalization. But if it is based on our experience, it would be an empirical generalization. If, for example, we say that, *so for as our experience goes*, all red mangoes are sweet, all ruminants are cloven-footed, all dogs are faithful, etc., but we do not know why, our generalizations would be empirical generalizations.

The Basis of Generalization.—The Laws of Causation and Uniformity of Nature are the bases of Generalization. If there had been no causation, that is, if things could happen without any causes, we would not be able to generalize. Also, if there had been no uniformity in Nature, that is, if things changed their behaviour, we would not be able to generalize. For example, if fire sometimes burnt and sometimes did not, we will not be able to generalize anything about fire. Because fire is uniform in its behaviour, we can generalize about it.

Moreover, generalization would be impossible if the various facts of Nature had not been inter-connected. We can generalize, that is, pass from "some" to "all" only because Nature is a system, a whole of inter-related parts, a unity. Thus, the unity of Nature is also a basis of generalization.

Generalization and perfect Induction.—Generalization goes from the particular to the universal, from some to all. In other words, it involves the inductive leap. Perfect Induction, on the contrary, involves no inductive leap; it is only a summary of the particular observations and does not go beyond them.

QUESTIONS

1. What do you understand by Generalization?
2. What is the basis of Generalization?
3. What is the difference between an Empirical Generalization and a Scientific Generalization? How can an Empirical Generalization change into a Scientific Generalization?
4. Analyse some popular proverbs and show that they are hasty generalizations
5. Distinguish between Generalization and Perfect Induction.

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