

If the research is drawn out over a period of time, a rather stable "theory" may be formulated by the scientists. This theory is usually a synthesis of the opinions which the researchers have expressed. It is of course always necessary that we do not confuse such a theory with fact. The scientists themselves usually realize this more fully than the general public does. This is illustrated in the treatment of certain evolutionary theories. A brief conversation with a scientist who has done extensive research on the past history of sharks will reveal that he readily recognizes the uncertainty of the theory of origin of sharks, whereas the general public usually thinks it is an established fact. Many similar examples could be cited.

Unfortunately, the explanations of certain types of scientific research projects which we find in newspapers and popular magazines often give an impression of more certainty than the scientists would express. In order to get the true picture, one should go to the professional journals in the field of research involved. In such journals we do not find the dogmatic statements concerning unsolved problems which are so prevalent in popular magazines and textbooks. This is because the scientists who have written the journal articles are very much aware that both their expression of opinions and their reporting of the data will be carefully scrutinized by fellow-scientists working in the same field. (The efficiency of communication is of course far better now than it formerly was.)

We should stop here to explain that there are a few emotional factors by which some scientists and science teachers are sometimes led to make more dogmatic statements concerning the certainty of their findings than is warranted. This is particularly true in the field of evolution. Such dogmatic statements are usually made orally, after which they make their way into popular writings (often magnified) by various means.

In closing this chapter we must take note of another, somewhat related, form of confusion into which people sometimes fall. This is the error of using a series of hypotheses, rather than a series of facts (data), to explain a certain phenomenon or condition in nature.

Suppose there were an isolated island in the Pacific Ocean which had recently had all the observable forms of life which were upon it destroyed by an earthquake, tidal wave, and near-by erupting volcano. A group of travelers come upon the island, not knowing anything of the real reason for its present condition. One member of the party formulates a hypothesis that this devastation was produced by a hydrogen bomb. He knows some things about the effects of such bombs; for example, that they produce a great amount of heat, and that they release sufficient energy to crack open the surface of the earth. On the basis of this knowledge he begins to explain the process of destruction to his companions. Together they notice the cracks in the earth, and the effects of heat (but fail to look for evidence of the very intense heat and radiation which hydrogen bombs produce). The hydrogen bomb hypothesis strikes them as being very plausible,