

for the scientists of the polio vaccine research teams of the 1940's and 1950's to have made significantly prejudiced selections of data, and thus delay their work. Or again, what petroleum geologist would make biased selections of data as he takes well core samples to investigate the underground strata, with a view to discovering oil? Such a defect in his work would frustrate both himself and his employer; and, if his work is published, subject him to the criticism of other geologists working on the same types of strata. We might also add that it is fortunate for those of us who are interested in learning the facts of God's record in nature, that much of the data which we use comes from petroleum geology research. This gives us a safeguard not enjoyed by those who use data which was collected for some less practical purpose--such as that of supporting a controversial theory. This is very evident when we read the descriptions of various local stratigraphic columns in petroleum journals. In these we readily notice that there is much less of the theoretical, and more genuine analysis of the underground environments of petroleum formation. This research characteristic is largely responsible for the phenomenal success of petroleum geology during the past few decades.

How then does a scientist collect and use data? To illustrate the process, let us assume that a geologist in an oil producing part of our continent is assigned the task of determining the relation of a particular rock formation or set of strata to the limestone which lies beneath it. After fixing in his mind a clear statement of the problem he is to solve, he sets about the task of collecting data. The first step in this collection process will usually be an investigation of the scientific journals which record previous observations on these same rock layers. After learning as much as possible in this way, the geologist will go and examine the well cores and drilling records from wells which have penetrated these and adjacent rock layers.<sup>4</sup> He will also compare the samples from the wells with layers of the same or similar rock which are exposed (outcrop) in the vicinity, all the while taking notes on his observations. These observations include not only simple visual examination, but also chemical analyses and microscopic examination of many samples taken from the strata the investigator is studying.

While our geologist is collecting data, certain hypotheses as to the meaning of them and as to the solution of his problem will naturally come to mind. These hypotheses are ideas or possible explanations based on the previous experience and knowledge of the investigator.<sup>5</sup> The successful investigator, however, knows that he must not allow any of his hypotheses to dominate his thinking or obscure the meaning of the data he is collecting. He recognizes that a hypothesis is an idea yet awaiting verification, and does not adopt any one hypothesis until a large amount of data has been collected. The next step for the scientist is the process of carefully analyzing, comparing, and interpreting the data. This may result in one of his earlier hypotheses being confirmed, or it may show all the hypotheses to be wrong and give a different answer. Thus the scientist is able to formulate a sound conclusion to the problem he set out to solve.