SCIENTIFIC METHOD IN THE STUDY OF HUMAN NATURE

Basic Assumption: The key to any true understanding of human nature is to be found in the realm of values, motives and meanings; and the problems thus involved are just as truly a subject for scientific inquiry as chemistry or physics.

What We Mean by "Science."

The essence of the scientific enterprise which has been responsible for such splendid achievements in the control of the material world is the co-operative attempt to organize human experience by the classification of facts, by the recognition of their sequence and relative significance and by the continuous submission of its generalizations to rigid tests.

According to John Dewey the steps in reflective thinking are as follows:

1. The occurrence of something felt as a difficulty or perplexity.
2. Observation designed to make clear precisely what the difficulty is.
3. The coming to mind of suggested solutions to the difficulty.
4. Reasoning out by the aid of memory and imagination what consequences are involved in the suggestions thus entertained and evaluating the suggestions by their aid.
5. Observation and experiementation designed to test by empirical fact the suggestee solutions in the light of their consequences.

Common sense, he says, stops short at 3, mathematical reasoning, scientific insight and untested scientific explanation and philosophy fall in 4, while careful attention to step 5 is the distinguishing characteristic of modern science.

Scientific Principles

1. Empiricism - The raw material of experience in all its complexity is taken as the starting point. Scientific reasoning proceeds from the concrete to the abstract, from the immediate to the remote, from the particular to the general. The scientist may be guided by generalizations and "hunches," but actual experience gives him his primary source and his final authority.

2. Objectivity - the personal equation is so far as possible eliminated in that facts and conditions are so described that others may repeat the experiment or observe for themselves and draw their own conclusions. Reliance is placed upon such tests rather than upon persuasion or argumentation.

3. Continuity - New phenomena are explained in terms of previous observation and generalization, the unknown in terms of the known. No explanations are accepted except in terms of tested and ordered experience.

4. Particularity - the field of inquiry must be limited and the problem clearly defined. It is necessary for the time being to devote oneself to some small portion of the universe and to neglect the rest.

5. Universality - the particular can be understood only in the light of the general. The aim of all scientific work is to discover relationships that are universally valid.

6. Provisionality - the true scientist is careful to recognize that all his findings are tentative and subject to revision.

7. Economy - "Neither more nor more onerous causes must be assumed than are necessary to account for the phenomena." Corollaries:
   a) Between two theories, each of which accounts for a given set of facts, that one is to be accepted which brings them into unity with the wider field of experience.
   b) As between two explanations, a multiple simple hypothesis is more apt to be true than a single recondite explanation.
   c) The scale of accuracy in any bit of explanation must be exactly suited to the end in view, to the yard-stick used and to the mataerial under consideration. It may be as much an error to use too fine a scale as one that is too coarse.

8. Disinterestedness - The desire to find the truth must be supreme. Rigid honesty and accuracy and the ability to recognize and discount personal bias must characterize the good scientific worker.

Scientific Procedures -

The methods upon which science relies to test its suggested explanations (hypotheses) fall into three groups:

1. Controlled experimentation designed to measure the influence of a given variable by excluding all external stimuli in order to determine the exact functional Relationship.

2. Naturalistic observation - exact description together with explanation in terms of relationships.

3. Statistical studies designed for the evaluation of variables where controlled experimentation is not possible.

Scientific Method in the Social Sciences

1. The scientific principles listed above apply in toto.

2. The method of controlled observation is ruled out
   a) by the complexity of the subject matter and the difficulty or impossibility of isolating the variables.
   b) by the impossibility of tampering with living men or institutions, as controlled experimentation would require.

3. Statistical methods have important uses and also serious limitations. They are properly used only to verify hypotheses or "hunches" gained thru intensive study of particular cases or situations. A thoro knowledge of and feeling for the data should precede the application of even the simplest statistical methods. Nothing is gained by applying statistics to unreliable data.

4. Judgments of value are indispensible in all scientific operations. No ends are ever assumed as fixed. The scientist asks rather, If such and such a course is followed under such and such conditions, what is likely to happen? His reasoning therefore involves evaluation. The great difference between the physical and the social sciences lies in the kind of values which are involved. In the case of the physical sciences they are of limited range. In the case of the social sciences those values which we call "ethical," or "moral", come definitely into the picture. Without taking them into account it is impossible to understand men, either individually or collectively.

5. The participant observer, such as the social worker or the minister of religion, is in a peculiarly advantageous position to observe the operations of motives and judgments of value.

R e f e r e n c e s

John Dewey: Logic chapters 4, 6, and 24.

Burtt: Principles and Problems of Right Thinking, pp. 83 - 92, 255 - 263, 270 - 351; also chapter 14.

Ritchie: Scientific Method. chapters 1, 3, 4, 5 also ppd. 179 - 202

Rice: Methods in Social Science

Boison: Exploration of Inner World chapter 7
"Co-operative Inquiry in Religion."

Boison