CHAPTER I

PICTURES AND TELEOLOGY

1. SCIENCE, PHILOSOPHY, AND CHANGE

Change is one of the fundamental facts with which the scientist deals. The philosopher is also concerned with change. His worries, however, are not those of the scientist. The scientist's concern can be located in his efforts to construct theories to explain and predict with increasing adequacy the changes which occur in the physical world. The philosopher worries about the conceptual requirements for inquiry entailed by the efforts of the scientist.

In particular, there are two different, but related, sets of worries concerning the questions of change to which the philosopher directs his attention: the conceptual tools with which the scientist conducts his inquiry, i.e., theories, and the nature of the scientific enterprise itself. In the first case he examines the viability of specific modes of explicating certain concepts employed in explaining the events of the world, e.g., 'law' and 'evidence'. In the second case he evaluates, catalogues, and explicates scientific inquiry itself. Part of this job involves elaborating a conceptual framework within which science is to be viewed. Since scientific inquiry is a dynamic developing process, a minimal condition of adequacy for the philosophical framework is that it be able to handle the conceptual changes which are part of the development of science.

While scientists always use theories in their systematizations, they sometimes abandon one theory in favor of another. Given the results of more traditional positivistic analyses of the relation between theory and evidence, 1 there arises the problem of establishing rational grounds for rejecting one theory and accepting another.

Now this is not a question about the psychology of decision-making, nor does it concern only the means of justifying an acceptance or rejection. Rather, it is first and foremost a question about the conceptual prerequisites for such action. To rationally reject a theory requires that the decision take place in a conceptual framework which encompasses more than the theory itself. This framework must extend beyond the theory in order for an evaluation of the theory to be possible. Without the possibility of such an evaluation we eliminate any chance to be rational with regard to the decision. It
must also be a large enough framework to permit alternative paths of inquiry when the inadequacy of a given course of action becomes evident. Otherwise, the shift to another theory as another way of organizing data about the world could not be described as rational. That is, no reasons could ever be given to explain why the choice of theory was a good one, or even why the old theory was a bad one.

The problem of explicating change in science, where 'change' refers here to science and not the world, precipitates a question concerning the proper characterization of science. Is science a process of a product? Not all share the working assumption here that science should be analyzed as a process of inquiry. The usual approach to the process of science involves examining the activities of scientists discovering, developing, and testing hypotheses and theories. But doubts arise as to whether that is the proper object of investigation for the philosopher. The proper object, it is argued, is the finished tested theories and the criterion for testing these theories; in other words, science is best discussed in terms of its product.

Basically, this conflict concerns the proper method of analysis. Should we seek criteria for evaluating the products of science or should we seek criteria by which we can rationally seek alternatives to the present answers and ways of giving answers? Distinguishing between the logic of justification and the logic of discovery to characterize the objectives of these two quests, the latter question concerns the possibility of a logic of discovery. Is there a justifiable method for generating new theories, which method would in some way guarantee the usefulness of those theories? Is the process of scientific inquiry justifiable, or must we limit our efforts to justifying only the product?

But, on the other hand, is the product of science justifiable? Wilfrid Sellars agrees with the positivists that it is. However, on his account the dichotomy between process and product must be eliminated in favour of a teleological account of scientific inquiry. While Sellars has argued against the positivist approach to the justification of theories, nevertheless, he believes that there is a sense in which the product of science can be justified. Moreover, he sees in the manner of justifying the product of science a way for the process of inquiry to be justified in turn.

There has been, however, a close identification of the idea of the process of science and the logic of discovery with psychological issues of creativity. In what is oddly called The Logic of Scientific Discovery, Karl Popper gives short shrift to the problems of the scientific process. The topic of Popper's discussion is justification, the justification of whatever it is we may dream up