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developing technology that exploits our detailed knowledge of atomic structure, while philosophers bewail or revel in the alleged impotence of reason to grasp even relatively simple facts?"

And so he arrives at the crux of the matter: the failure of philosophers to offer a solution to what has been called "the problem of induction." Induction is the process of inferring generalizations from particular instances. The problem—how does one know the truth of a generalization?

Harriman shows that a generalization, to be true, must be the statement of a causal relationship. Furthermore, a set of generalizations forms a hierarchical pyramid: At its base, the starting point of induction, are first-order generalizations consisting of elementary causal relationships such as "pushing a ball causes it to roll." Subsequent higher-order generalizations eventually culminate in scientific theories. Along the way to presenting his fascinating solution to the "problem of induction," Harriman addresses several key questions: What is the structure of inductive reasoning (chapter 1)? Why is mathematics the language of physics (chapters 2, 3, and 7)? How does proper interpretation of an experiment depend on a scientist's context of knowledge (chapters 1, 2, and 5)?

That scientists *should* employ the inductive method is not the main theme of *The Logical Leap*; rather, the book makes the stronger claim and demonstrates that scientists *must* use this method in order to make progress. And many scientists are indeed making progress even now, particularly in the applied fields. But what happens when the inductive method is misapplied, or worse, abandoned? String theory is a 20th century case in point: Some physicists accept it because it is "beautiful," not because it was induced from observational evidence. That sort of reasoning has caused many fundamental theories of contemporary physics to stagnate for more than a generation. Indeed, Harriman quotes the late Harvard University chemist E. Bright Wilson, who said, "It is very unsatisfactory that no generally acceptable theory of scientific inference has yet been put forward. Mistakes are often made which would presumably not have been made if a consistent and satisfactory basic philosophy had been followed."

The Logical Leap is the most satisfying resolution of the "problem of induction" that I've come across. It not only shows how inductive reasoning comes about but also demonstrates that it is the sine qua non of progress and success in physics and, more generally, in science. Harriman's brilliant work is destined to be the fountainhead of future studies in the philosophy of science.

Ulrich Gerlach
Ohio State University
Columbus, Ohio

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