

BOOK REVIEWS

Selection of books for review is based on the editors' opinions regarding possible reader interest and on the availability of the book to the editors. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.



COYOTES, RELIGION, AND SCIENCE

Title Science and Imagination
Author Warren Weaver
Publisher Basic Books, Inc., 1967
Pages xvi + 295
Price \$5.95
Reviewers Don M. Yost and Señora Lupe de Sinaloa

According to some distinguished gentlemen, there is a tendency to place scientists in a separate culture from that of the humanists and men of the street. Scientists are undeservedly pictured as living and working in rosy clouds of incense, garlands and wine; congress and the foundations are supposed to shower them with gold for their many abstruse researches. Since the other culture doesn't understand DNA, space satellites, and thermonuclear bombs, or even how to fix a television set, they are quite dependent on the scientists for much that bears on their very existence in this now overgoverned world. Before this dependence becomes too, too otherworldly, it is obviously up to the scientists to explain clearly the nature of science and the vital questions raised by it.

Dr. Warren Weaver (1894-) is particularly well fitted to present the essence of science to all who can read. Professionally he is a mathematical physicist; he spent his earlier years as such at universities. (He is still, presumably, on leave of absence as of 1920 from Caltech.) In 1932 he became a director of the Rockefeller Foundation, a private foundation which has, over the years, made major grants for the support of important researches in the physical

and biological sciences, agriculture, and medicine. This country's present prominence in science is due largely to the Rockefeller Foundation and its director. With all this background, plus a talent for writing in refreshing kitchen English, it is not surprising that Dr. Weaver's present book is an excellent one. It is a pleasure to recommend it to the general reader as well as the banker, the bishop, and the housewife. It wouldn't hurt anything if William F. Buckley, Jr., Glenn Seaborg, and Pedro Corral were to read it too (which reminds us to say that we wish these gentlemen would do something to put a stop to scattering H-bombs all over Spain and Greenland; such carelessness smacks of social and fiscal irresponsibility).

But now let's look at Dr. Weaver's book. His selected papers plus introductory notes are distributed over eight chapters, the papers in each chapter being more or less devoted to the same theme. Each theme can range over considerable territory, however, because Dr. Weaver's interests cover both specifics and grand consequences to be drawn therefrom. He is also much interested in a British school girl named Alice, who is even known west of Dodge City.

Chapter One first tells us what science isn't and then what, in Dr. Weaver's opinion, science is. He makes a distinction between pure or fundamental science and technology; both have high virtues when used constructively. He emphasizes the necessity for science and scientists to be free and unfettered so as to ensure the greatest all-around benefits; by analogy one doesn't get great poetry by hiring a poet at so much an hour, so Dr. Weaver says.

Chapter Two is entitled "More about Science." It carries the subtitles Imperfections of Science, Scien-

tific Explanation, and The Pageant of Size. Imperfections of Science ("The Dark Lady of the Laboratories") contains the subject matter of an address before the American Philosophical Society, a small coterie centered somewhere east of Medicine Bow. The address begins and ends with quoted verse, and there are three verses in between; *we* (= the reviewers) don't approve of one of the in-between verses because it contains a naughty phrase often abbreviated to S.O.B. Miss, or is it Mrs., B seems to have a suspiciously large number of children and should probably be investigated by the IRS and HEW. We may add here the conviction that only Shakespeare and sailors really know how to use raffish expressions properly. Anyhow, Dr. Weaver is here concerned with such matters as *reality*, *subjectivity*, and *objectivity*, and *deductive* and *inductive* logic. We are surrounded by so many material objects, that it is difficult to believe that they are not real; even the new submicroscopic particles and the elusive quarks have an air of authority. In fact, it seems quite natural and salutary to be a materialist and hedonist. But Dr. Weaver doesn't dodge the question of reality so cavalierly. The decision to be objective is no doubt subjective, and we will let it go at that here. For a long time following Aristotle, his development of logic was considered above suspicion; but in more recent times doubt has been cast on logic itself, and not all the doubts have as yet been resolved. Besides deductive logic, science makes much use of inductive logic; thus, if a few samples of copper are found to be conductors of electricity, we say, *ergo* any piece of copper is a conductor! But south of the Rio Bravo one encounters numerous young men named Pancho

(= Francisco); only feminine logic would lead to the conclusion that all young men south of the border bear the name of Pancho. So a dilemma.

Based on experiments and observations on both inanimate and animate systems, science has been amazingly successful in its ability to make correct predictions. But it ordinarily restricts itself to answering the question *how?*, not *why?*. Although scientific explanations are not unique, they do give one the comfortable feeling that the phenomena explained are dependable.

The chapter ends with a discourse on the very small and the very large. Among other things one learns that a person is made up of 10^{15} cells, each about 1/1280 of an inch in diameter. Each cell contains some friendly goo and a nucleus. This nucleus consists somehow of some strings of chromosomes and genes plus some DNA. The DNA is supposed to control our hereditary characteristics. There are indications now that biologists may soon be able to modify our inherited characteristics.

Chapter Three deals with Science and the Citizen. Dr. Weaver emphasizes how important it is that the citizen understand clearly the nature and spirit of science. After all, the citizen not only pays for the researches (taxes and the like), but the results, both theoretical and practical, are playing an increasingly vital role in his very existence.

In Chapter Four, entitled Science and Religion, we come into Indian Country. Scientists and clerics have long been edgy toward each other on philosophical grounds. The scientist demands proofs and experimental verifications in any subject matter under discussion; he knows that theories may come and go like bubbles, and he doesn't mind too much if one theory has to give way to an entirely different one overnight. The cleric, on the other hand, is apt to have a fixed faith in principles and traditions of ancient agrarian origin; his focus is on conduct, moral meaning, and revelation. He does not demand fresh verification of old statements of a fact. Moreover, the cleric is apt to be slow in examining his religion in the light of modern scientific findings. Dr. Weaver considers himself a religious man; he feels better after going to church. We might describe him as an enlightened Christian. His present book might well be used as a text in a required course in theology.

Also discussed in Chapter Four is the question of statistical morality. When a workman sets forth in his automobile he increases the chance of traffic accidents; is he guilty of statistical sin? If a nubile, young woman bears a child, she contributes to the already alarming population explosion; is she also guilty of statistical sin? Questions like these bother Dr. Weaver and he very much wishes clerics would take them more seriously. So do we.

Modern medical and biological discoveries have raised some highly important moral and religious questions which the clerics have so far ignored, but this doesn't prevent Dr. Weaver from raising them as for example, transplants, prolonging life, and, we may add, artificial insemination.

The next two chapters are entitled "The Theory of Probability" and "Communications," respectively; both subjects are highly important and Dr. Weaver has made significant contributions to both. One cannot escape the conclusion that man is a highly improbable creature, and women are more so.

Chapter Seven is entitled "Peace of Mind." Dr. Weaver is against it. If he didn't have something to concern himself about, he would be downright unhappy.

Finally, comes the strange Chapter Eight on Lewis Carroll, the author of the Alice books. Lewis Carroll was really his pen name; under his real name he was a mathematician at Oxford, and he wrote books on determinants and symbolic logic. In the latter he poses such delightful problems as

Fossils are never crossed in love.

Oysters are not fossils.

Therefore . . .

Dr. Weaver has made an extensive collection of the various translations of the Alice books, and it is clear that he has a great admiration for Carroll and fondness for Alice; the Alice books seem to provide fine examples of what imagination and fantasy can add to life. I, the senior reviewer, have never read the Alice books; having grown up in a frontier valley in southwest Idaho, I was surrounded by so many real wonders that any imaginary ones would have left me flat. And besides, Alice was just a girl and probably couldn't ride a horse, climb trees, shoot coyotes, or catch trout, and so couldn't possibly be of much interest. But I, the junior

reviewer, have read the Alice stories while sitting up in a tree and found them a perfectly delightful introduction to uncommon sense and skepticism. And who wants to shoot the pretty coyotes and thereby upset the world's ecological balance.

It is easier by far to read and praise Dr. Weaver's book, including the fine Foreword by Professor Beadle, than it is to cover the broad but accurate subject matter in a review. The book is inspiring; it inspires one to look again and again at nature and how she works. It inspires us to look onward for a neater, sweeter maiden in a cleaner, greener land.

Don M. Yost (1893-) was reared in the fresh air of Idaho and educated at the Universities of California and Utah, at Caltech, and in the U. S. Navy, which may explain why his countless friends regard him as a true salt of the earth. Author of classics such as Yost and Russell, Systematic Inorganic Chemistry (Prentice Hall, 1946), an expert with languages (from Boisean to Boolean), and a professor (Caltech) who could recondition the recondite, Don Yost is equally well known for his book reviews, all of which carry a beautiful Boise Basin briskness.

Señora Lupe de Sinaloa, in addition to her obvious accomplishments at tree climbing and her love for coyotes, also likes hiking, cybernetics, swimming, library science, and exploring. She graduated from the University of California at Berkeley (in chemistry) and says she cannot help the fact that she is a girl.

FILLING A VOID

<i>Title</i>	Principles of Radiation Protection
<i>Editors</i>	K. Z. Morgan and J. E. Turner
<i>Publisher</i>	John Wiley & Sons, Inc., 1967
<i>Pages</i>	xix + 622
<i>Price</i>	\$13.95
<i>Reviewer</i>	Frederick P. Cowan

This is the long-awaited Oak Ridge textbook on Health Physics. It