The following chapter contains discussions pertaining to philosophy, philosophic and scientific certitude, philosophic and scientific attitudes, types of judgments and modes of thought used in reasoning, and comparisons between social, physical and mathematical sciences. The author states that his efforts, by experimental analysis of observations of statistical facts, have been to disengage their characteristics and their correlations and to establish the limitative conditions of the experimental validity concerning them. In order to reveal the danger of the abstract reasoning, which menaces the course of mathematical analyses in the experimental analyses, he insists on the existence of the conditions which should be realized in order that the formulas, obtained from mathematics, be legitimate.

In the first chapter of Part II the author states the ideas of Reichenbach concerning causality, uncertainty of scientific propositions and predicting future events. He compares his views with those of Reichenbach, examines the notion of uncertainty in science, states that the idea connected by Reichenbach to the idea of uncertainty is associated with the absence of causality, shows how causality is connected with probability and discusses the relations of philosophy to scientific procedure of experimental analysis.

Chapter VII contains de Broglie's definition of determinism, an explanation of how de Broglie considers causality and determinism and his illustration relating to electrons shot from a cannon, bombarding a surface of a crystal, quotations from Planck, Einstein, Lord Rutherford relating to causality, a discussion of philosophic and scientific determinism in relation to causality and de Broglie's views on probability and frequency.

The following chapter presents the position of Barzin on notions of causality and determinism, which are characteristic of the attitude of logicians. Logic researches concerning probability establish the necessity of affirming a principle of induction in the sense that it adopts universal determinism; each theory of probability implies logically causal relations. By the use of perfect and imperfect games of chance the author compares his views with those of Barzin and points out the difference between the calculus of probability and statistical laws. Barzin believes that the principle of statistical induction rests on the affirmation of a determinism; Hostelet believes that this principle implies causality.

The last two chapters treat of comparisons of the philosophic and scientific attitude and the role of scientific methodology. Near the close of the book the author states that to practice the scientific method is to give the mind more security in the acquisition of knowledge, is to increase the surety and the power of its faculties of intuition and invention, is to prepare the accord of intelligences to render them tolerant and conciliatory.

W. D. BATEN

Science in a Tavern. By Charles S. Slichter. Madison, Wisconsin, University Press, 1938. 9+186 pp.

The title of this book refers to the meetings in London taverns and private houses, beginning about 1650, of English scientists and men of means and philosophical interests. At these meetings a great deal was eaten and drunk, discussion and even experimentation took place. It was from this nucleus that the Royal Society was formed in 1662. After that an inner circle still dined before the meetings of the Society and in 1725 formed a dining club. Dean Slichter, in the first two essays of this volume sketches the parallel early histories of the Royal Society and of the Club, stressing the importance for science of the patronage of the men of wealth and social position who belonged to these organizations.

The following essay deals with men of universal genius, polymaths they are called; Archimedes, Leonardo, Euler, the three Bernoullis, John Wallis, Sir Christopher Wren, Newton, Thomas Young, Lagrange, Hamilton, D'Alembert, Huygens are briefly mentioned as examples. The careers of two polymaths, Kelvin and Heaviside, are discussed in more detail and an interesting comparison is drawn between the fame of Kelvin during his lifetime and the comparative obscurity of Heaviside. Kelvin is described as an extrovert, Heaviside as an introvert with greater depth both scientific and spiritual. In another essay, on Newton, credit is given him for industrialism: "If recent industrialism is a blessing, give initial credit to the *Principia.*" This oversimplification reflects the general tendency of the book to discuss only English scientists and contributions to science.

In an essay entitled "Industrialism" Dean Slichter defends the scientific method as capable of resolving the conflicts of modern civilization. "Science brings its own remedies and removes the evils that it has itself created. If it were otherwise science would not be science." He evidently does not take the point of view that science assists men to get what they want, but must leave the determination of those wants to factors outside the domain of science. He assumes: "There is a best way and experts are selected to find and direct it." He believes, apparently, in "government for the people." The essay entitled "The New Philosophy" discusses controlling the power provided by science. Dean Slichter says: "in England spiritual control may grow and spread from the Universities. In America I expect the hope of the new philosophy to lie not with the university faculties, but with men of the world; with leaders in the industries; with engineers and business men and lawyers and men close to affairs. We must look for a new Christopher Wren who can look upon life as a whole. . . ."

W. FLEXNER

Essai sur l'Unité des Sciences Mathématiques dans leur Développement Actuel. By Albert Lautman. (Actualités Scientifiques et Industrielles, no. 589.) Paris, Hermann, 1938. 62 pp.

In the introduction to the first edition of his *Gruppentheorie und Quantenmechanik*, Hermann Weyl remarks that whereas it was fashionable in the past century to arithmetize all branches of mathematics (for example, the study of geometry was reduced to the study of a metric), it has now become fashionable to axiomatize all branches of mathematics (the study of analysis is now based on a study of abstract spaces). Lautman attaches undue significance to these remarks, and interprets them as meaning that there is a schism in mathematics. Lautman's personal belief is that the distinction between the two kinds of mathematics corresponds only to historical conditions in the development of mathematics, and he undertakes to prove in this book that the schism implied by Weyl's remarks does not exist.

As a matter of fact, no such schism exists, and it is to be doubted if any mathematician really thinks that one does exist. A careful reading of Weyl's remark in its context would seem to indicate only that he was drawing an analogy between the earlier change in the point of view of the mathematicians and the change then occurring in the point of view of the physicists because of the new quantum mechanics. So Lautman is tilting against windmills.

In spite of its inconsequential result, the book is interesting to read. Lautman takes algebra (of the van der Waerden type) and topology as representative of the one sort of mathematics, and analysis as representative of the other sort of mathematics. He then gives many examples of cases where the methods or results of one are used in the other. In the first chapter he discusses uses of the ideas of linear dependence and dimensionality in analysis, as in Hilbert space for instance. Also he brings out