

Athenians. The second contains an account of the work of Plato and Aristotle and their immediate successors, which he describes as a great adventure in search of unitary systems of thought. Then the work of the Alexandrians is analysed. The divorce of science and philosophy is noted, together with a failure of intellectual nerve.

In the Roman period, science became the handmaid of practice, and was accompanied by a general failure of intellectual inspiration. This was followed by an almost complete failure of knowledge during a whole millennium. Then there was a revival of humanism and an attempted return to the culture of antiquity. The downfall of Aristotelianism was accomplished at the start of the seventeenth century, and was accompanied by new attempts to give a synthetic description of the universe and Nature. The Newtonian mechanistic scheme and determinism were enthroned, and have endured until recently. Dr. Singer finds no change of method since the seventeenth century, but only an immense extension of scientific knowledge.

His comments on the relations between the Christian outlook and the development of science are very interesting, and are supported by excellent quotations from St. Augustine and other fathers of the Church. He discusses with unusual illumination the contributions of Syrian and Jewish scholars, and he shows how much of what passes as Arabic science was really due to them.

The stages of the change of ideas during the passage from pagan to Christian thought are most conveniently summarized in half a page. The fundamental premises of alchemy are epitomized in the same way, and there are similar summaries of Goethe's contributions to biology; Schwann's theory of the cell, Claude Bernard's conception of the internal environment, and the origins of the theory of evolution.

Dr. Singer's learning is always exact, as befits the senior British historian of science. His book is full of fascinating information, and will at once become a standard work on the history of science both for the man of science himself and the general reader.

J. G. CROWTHER.

STUDIES IN BACTERIOLOGY

General Bacteriology

By Prof. D. B. Swingle. Pp. xii+313. (London: Chapman and Hall, Ltd., 1941.) 16s. net.

THE method of presentation of a subject taught at every university by a writer of another nationality differs, of course, from that customary in Great Britain. It is only fair to say that the distinction may be more apparent than real, and that it is usually a question of manner, not of matter.

Prof. Swingle has a standing in his subject which transcends mere geographical boundaries. A textbook by him therefore on his own subject rightly arouses interest. He has drawn freely on his own experience in teaching and research in determining the lines on which he has drawn it up.

Micro-organisms are closely related to the whole problem of disease; they play also an important part in the manufacture of certain industrial commodities, such as dairy products and alcoholic beverages, and incidentally the curing of tobacco. The importance of these relations explains why bacteriology tends to be given a secondary place in that it is usually considered from the angle of one or other of its effects or uses. Prof. Swingle

rightly prefers to present the subject as a science in itself; thus therapy alone is permitted a homogeneous and complete description. The details, helpful or otherwise, of the activities of micro-organisms in their practical aspect are by no means neglected but are given proportion corresponding to their importance.

"General Bacteriology" thus offers a systematic approach to the subject as a whole. The fundamental principles are fully covered and proper space allotted to the important aspects of classification, morphology, reproduction, growth, nutrition, relations to environment and the products of bacteria. After covering this groundwork, Prof. Swingle goes on to micro-organisms of soil, of water, air, sewage and foods, proceeding in natural sequence to discuss contamination of food, industrial micro-biology, and the relations of bacteria to disease processes, infection and immunity.

Prof. Swingle writes in a simple, straightforward style, easy and readable. The illustrations are adequate in number and in applicability. The book can be commended as a thoughtful and balanced presentation of the subject of bacteriology as a whole.

J. GEOGHEGAN.