The chapters on the document examiner and the ballistics expert are not included in the group of chapters devoted to the laboratory specialists, perhaps because these two categories of specialists operate in fields that are not so clearly areas of "pure" or basic science. Instead, the two chapters devoted to the document examiner and the ballistics expert are inserted in the series devoted to criminal specialties, between the chapter on breaking offenses and that on abortion. The author has also illogically included a chapter on criminal responsibility between the chapter on drug trafficking and that on alcohol and motor accidents. It appears that the organization of the book could be improved by rearranging the chapter sequence.

The next-to-last chapter deals with instructive and unusual cases and adds materially to the "whodunit" value of the book. The introductory chapter contains an interesting account of the development of scientific crime investigation and the establishment of crime laboratories in England.

The concluding chapter—on some foreign laboratories—is not sufficiently detailed to give the criminalist an understanding of the facilities of these laboratories in terms of the quality and quantity of staff and equipment.

The author has illustrated his discussions of scientific techniques with examples drawn from actual criminal cases. It is these accounts which make the book appealing to the lay reader.

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Introduction to Historical Geology. Raymond C. Moore. McGraw-Hill, New York, ed. 2, 1958. ix + 656 pp. Illus. $7.95.

Extensive expansion and revision mark this new edition of a widely used text by one of the world's grand masters of the historical geology chessboard. Except for some illustrations, little remains unchanged in the new work. The page size is larger, the text is longer, and the 600 illustrations nearly double the number in the earlier edition.

After first treating the scope of historical geology and evolution, the book examines briefly several theories of our earth's origin, without, however, supporting any specific hypothesis. Next comes a considerably expanded coverage of the Precambrian, here called the Cryptozoic eon. After this, individual chapters treat each succeeding geologic period, describing rocks and fossils, paleogeographic history, life, climate, and economic resources, all primarily from the viewpoint of a geologist working in North America. The final chapter outlines our scanty knowledge, as of several years ago, of man's geologic history. Recent finds—such as *Oreopithecus,* the Tuscan ape man, or the Swanscombe man—are not discussed, and the reading list needs some updating. For example, Wormington's classic work, *Ancient Man in North America,* is now in its fourth edition, not its second, and although one of Sellard's earlier papers is mentioned, his later book is not.

Three appendices complete the text. The first describes fossil organisms and is a superb exposition, reflecting the author's international eminence in paleontology. The second pictures many common lithologic symbols, and the last provides a glossary of technical terms.

Completely new features in this edition, deserving of special commendation, are the list of suggested readings and the dozen or so review questions at the end of each chapter. Each of the questions is carefully designed to induce the student to think and to reason from a background of factual information acquired through previous study.

Some terms not commonly used in the United States, but eminently satisfactory, are applied throughout the book. The European division of the Cenozoic into Paleogene and Neogene is adopted, and dolomitic rocks are called dolostones. Is the influence of a standard glossary at last infiltrating geologic science? The numerous illustrations, many of them new, are uniformly clear and appropriate. Some, such as the geologic maps showing outcrop and subsurface occurrences of the rocks of each system, provide useful reference information on every period since the Cambrian.

For teachers of historical geology this book is an excellent text. It provides a wealth of factual information, useful for stretching the minds of even the most competent students.

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Scientific Manpower in Europe. Edward McCrensky. Pergamon Press, New York and London, 1958. ix + 188 pp. $4.50.

"The role of management of scientists in government is the principal theme of this study." The first three chapters consider some of the things a scientist looks for in a government career, some of the methods used by several Western European governments to attract and hold scientists in public service, and the levels and systems of payment. The material is drawn from Great Britain, France, Western Germany, the Netherlands, and the Scandinavian countries.

Three other chapters describe (i) the representation of scientists in the establishment of employment conditions and rates of pay—for example, through the highly organized unions of the Scandinavian countries and the formal channels for joint consultation in Great Britain; (ii) the higher education of engineers in several countries; and (iii) several national patterns for the organization of research. A concluding chapter makes comparisons with the United States. These topics are treated very briefly.

There is growing recognition in the United States of the need for thorough and systematic review, and probably revision, of administrative practices controlling the recruitment, promotion, payment, and transfer of civil service scientists and engineers. This is all part of the larger issue of how best to organize and manage a government scientific program of expanding immensity. McCrensky's little book touches on many aspects of these problems, describes systems in use elsewhere, once in a while expresses a judgment as to how effectively different systems work, and thus provides ideas that might well be considered in the United States. But nothing is treated in depth; decisions to change present practices would require substantially more information than the author presents.

DAEL WOLFLE
American Association for the
Advancement of Science

Principles of Research in Biology and Medicine. Dwight J. Ingle. Lippincott, Philadelphia, Pa., 1958. xv + 123 pp. $4.75.

In this unusual little book, which is addressed to "students who are preparing for or are beginning research in macrobiology and medicine," the author has attempted to survey the rationalities and methods of science all the way from basic aims and the fundamentals of logic to the selection and care of laboratory technicians. He makes this attempt in some 120 pages of short, concise assertions, aided by quotations from Lewis Carroll but without the aid of any illustrations, tables, quantitative data, or symbolic methods and with the introduction of very few examples.

The book is fundamentally sound but so condensed into generalities that controversial points are not explicitly asserted. It is hard to argue with the politician who asserts that evil is bad, and it is probably just as hard to deny, for example, that "causality is a useful assumption for scientists in the fields of

biology and medicine." If one feels uneasy about Ingle's "basic assumptions" that "if conditions are the same, the results will be the same," or that "when other factors are constant, each variable permits but one maximum," he may find consolation in the "self-evident assumption" that "some degree of uncertainty, however slight, remains in all phenomena, and natural laws are presently regarded as statistical."

This book is evidently the outgrowth of a great deal of reading and reflection. It might have been prepared by perusing treatises on research and attempting to condense the gist of each into a single sentence, with subsequent grouping of the sentences into paragraphs and chapters. Thus, much that is valuable or indispensable to the presumptive scientist is here compressed into very little space. My big question is whether anyone can really understand this book unless he already understands the subjects dealt with. To select a single example from among dozens of possibilities, I wonder just who is going to profit from being told that "when the investigator wishes to compare more than two means, he can use a method called analysis of variance, which represents an extension of the concept of standard deviation."

Perhaps courses can be designed to explain, illustrate, and amplify this skeleton of a text. For such specialized use, this book can be highly recommended to all who are presently handicapped by lack of a book like this.

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Punched Cards. Their applications to science and industry. Robert S. Casey, James W. Perry, Madeline M. Berry, Allen Kent, Eds. Reinhold, New York; Chapman and Hall, London, ed. 2, 1958. x + 697 pp. $15.

This second edition of *Punched Cards* is a substantially reworked edition. The largest portion of additional material appears in part 2, which recounts applications of punched cards, as in the first edition, without critical evaluation.

Like the first edition, this is largely an accumulation of material that is available elsewhere in published form, and a good deal of material is included that has only slight relationship to the subject of the book. Examples of this type of material are the article by E. J. Crane and Charles L. Bernier of Chemical Abstracts Service, dealing with indexing and index searching (chapter 24); this, while it is first rate, has little to do with punched cards, either internally punched for machine handling or edge-notched for manual handling. Similarly, chapter 26, by Byron A. Soule, deals with searching the literature and has little if any relationship to the subject of the book. Neither is Ascher Opler's article (chapter 29), dealing with electronic data processing machines, connected by any but the most remote relationship.

The bibliography on uses of punched cards (chapter 30) ranges the whole field of documentation, and the increase in number of references does not directly represent an increase in the punched-card literature. The bibliography includes a good many articles on electronic data-processing machines; photographic inputs for digital computers; the use of filmsort microfilm insert cards that may or may not be punched (those discussed in some of the articles cited are definitely not); Uniterm indexing with manual card matching (this again has nothing to do with punched cards); preparation of bibliographies by mounting typewritten slips; and many similar topics that are not related to punched cards.

The first edition, even though it was an expensive clip-and-paste job, was justified in the earlier stage of this art because it brought together a good deal of the industrial, technical, and machine operation material dealing with the notched-card and punched-card art. Since this has been done once, there does not appear to be much justification for a second edition which merely does somewhat more of the same, while retaining in large measure the first edition's lack of clarity, lack of sense of proportion, and lack of originality in the material presented.

This is a conglomeration of miscellaneous documentation materials, roughly clustered about the subject of punched cards, rather than a book. It lacks the synthesis, evaluation, and orderly presentation that would be necessary to make a substantive contribution, and it does little more than bind into one volume, at a high price, unevaluated material of varying pertinence, most of which is already available elsewhere.

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L. L. U. Translations Bulletin. Department of Scientific and Industrial Research, London, 1959. 4s. 5d. (annual subscription, £2 13s.)

The purpose of the *L. L. U. Translation Bulletin* is to provide British scientists and engineers who are anxious to have details of current research in the U.S.S.R. with up-to-date information on the availability of Russian translations. It will be published monthly.

The *Bulletin* contains lists of books, journals, and other scientific papers which are now available or which are being translated and will become available in the near future. One section deals with cover-to-cover translations—a scheme for providing a complete Russian technical journal in the English language—and another gives details of the work being carried out by the National Science Foundation in the United States.

The *Bulletin* also contains articles on new scientific developments in the Soviet Union. It is contemplated that the *Bulletin* will cover other language translations in the near future.

Orders should be sent direct to Her Majesty's Stationery Office, P.O. Box 569, London, S.E.1.

New Books

Science in Schools. Proceedings of a Conference under the auspices of the British Association for the Advancement of Science held 17–18 April 1958 at the Royal Geological Society, London, S.W.7. W. H. Perkins, Ed. Butterworths, London, 1958 (order from Butterworths, Toronto 6, Canada). $3. (Reviewed in *Science* **128**, 1132, 1958.)

Social and Psychological Factors Affecting Fertility. vol. 5. Concluding reports and summary of chief findings from the Indianapolis study. P. K. Whelpton and Clyde V. Kiser. Milbank Memorial Fund, New York, 1958. 285 pp. $1.

Some Problems in Chemical Kinetics and Reactivity. vol. I. N. N. Semenov. Translated by Michel Boudart. Princeton Univ. Press, Princeton, N.J., 1958. 239 pp. $4.50.

The Stratigraphy of Western Australia. J. R. H. McWhae, P. E. Playford, A. W. Lindner, B. F. Glenister, B. E. Balme. Melbourne Univ. Press, Melbourne, Australia, 1958 (order from Cambridge Univ. Press, New York 22). 161 pp. $8.50.

Streptomycin and Dihydrostreptomycin. Antibiotics Monogr., No. 10. Louis Weinstein and N. Joel Ehrenkranz. Medical Encyclopedia, New York, 1958. 116 pp. $4.

Studies in Linear and Non-Linear Programming. Kenneth J. Arrow, Leonid Hurwicz, Hirofumi Uzawa. Stanford Univ. Press, Stanford, Calif., 1958. 229 pp. $7.50.

The Submicroscopic Organization and Function of Nerve Cells. Proceedings of the Symposium held 15–22 March 1957 by the Venezuelan Institute of Neurology and Brain Research, Caracas. Academic Press, New York, 1958. 644 pp. Cloth, $14; paper, $12.

Surface and Radiological Anatomy. For students and general practitioners. A. B. Appleton, W. J. Hamilton, Ivan C. C. Tchaperoff. Fourth edition by W. J. Hamilton and G. Simon. Williams & Wilkins, Baltimore, ed. 4, 1958. 355 pp. $9.50.

Ten Steps into Space. A series of lectures sponsored by the Franklin Institute, March–May 1958, in Philadelphia. Monogr. No. 6. Journal of the Franklin Inst., Philadelphia, Pa., 1958. 202 pp.