

Book Reviews

Clarence King. A biography. Thurman Wilkins. Macmillan, New York, 1958. xii + 441 pp. \$7.50.

There is a dashing quality to the figure of Clarence King exploring the high Sierras at 20 and leaving Washington at 24 as United States Geologist in charge of the Fortieth Parallel Survey—a commission which Secretary Stanton told him was wanted by four major generals. King thirsted for adventure, whether it was hunting buffaloes, outwitting Apaches, or wrestling fever in Nicaragua or “old gold girls” in Hawaii. He went down the mines at Butte impeccably attired in clothes freshly cleaned and pressed by his valet. Henry Adams deferred to him on matters of art and poetry. He visited a Cuban revolutionary in a cell at Santiago and dined with Henry James in London. Perhaps he described pursuing a grizzly into a mountain cave in the tête-à-tête he held with the Prince of Wales at “Ferdyn” de Rothschild’s.

King was an expert witness, whose appearance in many a Western courtroom brought certain victory for his mine. He moved freely between the saloons of Leadville and the Players or the Century in New York. King at 30, exposing the great diamond hoax, might have been invented by Walter Mitty or a Douglas Fairbanks script-writer: “There’s not enough money in the Bank of California to make me delay publication a single hour. If you don’t publish, I will. But it will come with much better grace from you.”

Clarence King led two lives in more than one sense. In his young-manhood he joined with Whitney and Powell and Emmons in the great period of the geological exploration and discovery of the American West. This carried him to fame and the directorship of the then new United States Geological Survey. But he resigned his post after a year of solid accomplishment to devote himself to “expertizing” and the promoting of mines and of himself. King was the golden boy who lived on into the gilded age, and the ambiguities of the period were reflected in the man. When he left the august company at Roosevelt’s Boone and Crockett Club, or Pierre Lorillard’s

Tuxedo, it was to slip into Brooklyn as James Todd, a porter, to visit his Negro wife and children.

Thurman Wilkins has written a careful and meticulous account of “the most remarkable man of our time.” How did it happen, asked Henry Adams, that he could leave no more trace than one of Walcott’s fossils? King emerges somewhat pale and shaken from the pages of this biography, which gives a sober, scholarly, and disquieting view of one man’s headlong flight into oblivion.

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Particulate Clouds: Dusts, Smokes and Mists. Their physics and physical chemistry and industrial and environmental aspects. H. L. Green and W. R. Lane. Van Nostrand, Princeton, 1957. xix + 425 pp. + plates. Illus. \$11.25.

This treatise on particulate clouds originated at the Chemical Defense Experimental Establishment at Porton Downs, England. Sir Harold Hartley, in the foreword, points out the important role which this chemical warfare station has played in the development of protective measures against smokes, as well as in the production of protective smokes. The authors and their colleagues have, in their fundamental work on particulates, contributed to various sampling techniques, production of particles of uniform size and atomization, production of high-efficiency filters for protection in dusty operations and in atomic energy establishments, and development of spray methods for insect control.

The book is a most valuable account of the scientific studies and practical applications in this field, and only the personal contact which the authors have had, over many years, with its development has made this possible.

The first part of the book contains studies on the basic physics and physical chemistry of particulate clouds and treats them as unified systems, since many different types of clouds have essentially the same properties. In eight chapters

the production of particulate clouds, their physical characteristics, coagulation, deposition and filtration, analysis, and diffusion in the atmosphere are discussed.

The second part illustrates a number of practical implications of part I and goes into somewhat more detail on technical and practical matters. For example, the chapter on collection discusses cyclones, scrubbing, electrostatic precipitation, and filtration methods of many kinds. The second part contains, in addition, chapters on health hazards, atmospheric pollution, aerosols in nature, and the uses of particulate clouds for signal smokes, therapeutic purposes, and industrial applications.

A textbook of this kind, which must have required many years of careful preparation, could not be expected to be completely up to date in this rapidly moving field. Neither does it pretend to be all-inclusive. It provides, however, a background for more intelligent sorting of the flood of articles published by air-pollution agencies.

The concern which the authors express about the vast and scattered literature on particulates and its sometimes unwarranted growth is shared by many in the field of air pollution. By bringing together most of the topics on particulates, and supplying a thorough literature reference list after each chapter—thereby providing opportunity to obtain more details if desired—the authors have done a real service to the worker in this field.

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Chemical Publications, Their Nature and Use. M. G. Mellon. McGraw-Hill, New York, ed. 3, 1958. x + 327 pp. Illus. \$7.

When one sees an old friend in the form of a textbook newly revised after nearly 20 years, he naturally wants to know what is new and what has stayed the same. This review will attempt to answer the question for Mellon’s new edition.

The framework of the book remains essentially the same as that of the second edition, but this volume is about 45 pages longer. It is a tribute to the careful writing and organization to note that a good deal of the text, perhaps one-half, has been carried over unchanged.

Almost all of the important book and periodical lists have been done over, however, with old material included where it is still pertinent and recent publications added where they are significant. Some of the latter are dated 1957.

Mellon has rewritten and expanded the central section of the book, chapters 8 through 10, the latter chapter being a new addition. This has made an important topic, "Secondary and tertiary sources," more accessible to the student, and this chapter will undoubtedly be used for reference itself.

The final text chapter, "Making searches in the chemical literature," has probably been changed the least of any, but in this case lack of change is to be regretted. There has been a great deal of material published on how to make searches, and much of it is pertinent here. Several dozen references are given en bloc to papers on the subject in various numbers of the *Advances in Chemistry* series, but they have not been worked into the text.

The library problems, as before, constitute a thorough coverage of the material given earlier in the text. Most of them include new examples.

The index has grown about one-third but still omits names appearing in footnotes or reference lists.

The following remarks are offered in a helpful spirit and are not meant to detract from an excellent textbook. The *Bulletin analytique* is now *Bulletin signalétique*. I believe the *Ref. Zhur. Khim.* should be included as a searching possibility, despite the lack of subject indexes (page 230). Its name is misspelled on page 105 and in the index. A footnote on page 59 includes a misprint: "No. 4" is given, but "No. 10" is meant. UNESCO has done so much work with language dictionaries that some reference to it could well be included on page 191.

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Chemical Abstracts,
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Logical Design of Digital Computers.

Montgomery Phister, Jr. Wiley, New York; Chapman & Hall, London, 1958. xvi + 408 pp. Illus. \$10.50.

No previous knowledge of computers is assumed by the author of this introductory text, which is well adapted for independent study or for a one- or two-semester course. Its 12 chapters and two appendices cover general methods and techniques, not details of a particular computer with which the author has been associated. Almost every chapter has a collection of exercises and a selection of references quite adequate to lead the student further into the field. There are also many worked-out examples. In general, the book is easy to understand, and though the mathematical discussion may not seem particularly elegant to the mathematician or physicist, it compares

very favorably with those generally found in engineering texts.

The first two chapters give a bird's-eye view of digital-computer design, circuit components, and binary numbers. One needs hardly more than the names of circuit components and a brief description of how they behave for logical design for a general understanding of these subjects, so the reader need have no previous knowledge of them. The next two chapters deal with Boolean algebra and the simplification of Boolean functions. The rest of the book cannot be understood without a knowledge of the content of these chapters. Boolean algebra is the algebra of logic and of relay circuits, and while computers can be designed without it, the intricacies of modern computers and the logical properties of circuit elements have now become so complicated that the designer of computers would be like a mathematician without the convenience of algebraic notation if Boolean algebra were not available. Actually, Boolean algebra is inherently simpler than even high-school algebra, and the reader with modest mathematical attainments can master the material, even though the text sometimes will make him sweat.

The next chapter deals with the logical equations characteristic of memory elements [computers are essentially memory elements connected by decision elements (which were discussed along with Boolean algebra), decisions being made between "true" and "false," say] and shows how memory elements are connected to carry out a given operation. Greater generality is reached in the following chapter. The seventh chapter gives a survey of computer memories of large capacity (as distinguished from the one-bit or yes-or-no memories discussed earlier), which can be read or erased or have more information written into them. Input-output equipment, by which information is fed to or taken from the computer, is discussed next.

Chapter 9, on the arithmetic unit, shows how memory and decision elements are designed into circuits capable of carrying out the simple arithmetical operations and the logical operation of comparison. It is the longest chapter in the book and deals with many of the most important and ubiquitous problems of computer logical (not engineering!) design. Much of the technical jargon of the computer art can be learned from this chapter. The next chapter briefly treats error-detecting codes applied to error prevention in computers. Chapter 11 ties all the pieces together by applying the principles earlier expounded to the design of two simple computers, one of general-purpose, the other of special-purpose, design. The last chapter very

briefly touches on the ways in which the gaps between the logical equations and actual construction, and between construction and operation, are bridged.

To sum up, the book is a good introduction, can be read fairly easily by engineers, physicists, mathematicians, or logicians with only undergraduate training, gives an adequate guide to the literature for further study, and would equip someone willing to work out the exercises with sufficient facility in logical design to qualify him for work in a logical-design group.

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Surface Active Agents and Detergents.

vol. II. Anthony M. Schwartz, James W. Perry, Julian Berch. Interscience, New York, 1958. xv + 839 pp. Illus. \$17.50.

Since the late '30's, the field of surface-active agents has expanded almost explosively. In 1949 Schwartz and Perry published *Surface Active Agents: Their Chemistry and Technology*, which was a notably successful attempt to cover the field up to 1947. The present volume attempts to extend this coverage through 1956. Because of the extremely rapid development of the field (the patent and technological and scientific literature since 1947 far exceeds that available before then), the present book supplements rather than replaces the original and is hence designated volume 2.

The material presented is divided into four major subdivisions: "Processes for synthesizing and manufacturing surfactants," "Special function surfactants and compositions," "The physical and colloidal chemistry of surfactants in theory and practice," and "Practical applications of surfactants." Each of these sections is very well referenced, and this is perhaps the most useful aspect of the book. Because of the mass of material covered, only brief mention is made of each of the many topics in each section of the book. However, the inclusion of a very complete bibliography serves as compensation.

As can be seen from the book's major subdivisions, the authors are concerned primarily with the technology rather than the science of surface-active agents, and hence the book should be most useful for those whose major concern is syntheses of new materials or product development, or both. Nevertheless, the fundamentals are not completely overlooked.

The section on the physical and colloidal chemistry of surfactants rightfully