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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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