few typographical errors were found. In the formula for silvering mirrors, on page 343, caustic soda may be meant instead of "soda."

Altogether, the book is excellent and should be of value, not only to the professional optical shop workmen and apprentices for whom it was prepared, but also to scientists and amateurs who have any interest in the grinding and polishing of glass and crystals. It should be in every optical workshop.

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Matthews' Textile Fibers. Their physical, microscopic, and chemical properties. Herbert R. Mauersberger, Ed. Wiley, New York, and Chapman & Hall, London, ed. 6. 1954. x + 1283 pp. Illus. $16.50.

This sixth edition of an important reference work originated by J. Merritt Matthews 50 years ago has become a multiauthored compilation of which Mauersberger serves as a coauthor and editor. The great advance of the textile industry in production of synthetic fibers such as nylon, Dacron, Orlon, Acrylon, and Dynel, has required extensive additions to a text designed to cover the properties of these materials and the procedures for identifying them, either alone or mixed with other fibers. The book has been revised throughout with incorporation of new illustrations, new technical data, and extensive additions, not only in synthetic organic fibers, but also in the discussion of inorganic (glass) fibers, and identification and quantitative analysis.

In the discussion of each of the principal types of textile fibers, consideration is given to history and use, statistical information, microscopic characteristics, physical and optical properties, and chemical properties. The latter include effects of solvents, acids, alkalis, and the general dyeing properties of the fiber. The book is limited to the fibers and spun threads, and does not include characterization of woven fabrics produced from these fibers.

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Experimental Inorganic Chemistry. W. G. Palmer. Cambridge Univ. Press, New York, 1954. 578 pp. Illus. $9.

The author has written a book that combines the theory and practice of inorganic chemistry in a usable, useful, practical, and interesting fashion. It is recommended to all teachers of inorganic chemistry (not to be confused with general chemistry) as a pedagogically stimulating textbook. Emphasis is placed on the laboratory approach. Directions are given, not only for the synthesis of large numbers of typical and representative compounds but also, in many instances, for the analysis of the resulting products. "In analyzing the compounds they [the students] have themselves prepared they find no drudgery."

Some readers will argue that the organization of subject matter on the basis of the Mendelyeev classification of the elements is not modern, but this is a minor point since the theoretical material is most certainly up to date. Commendable is the emphasis on structural inorganic chemistry that constitutes an important part of both the introductory summary and the theoretical material preceding the experimental operations in each chapter. Specialists may also criticize choice of theoretical matter, but the teacher will find this book to be the best, if not the only "teachable," textbook covering the practice of inorganic chemistry. It emphasizes the necessity for analysis as an *important* adjunct to synthesis. Theory is employed to furnish the background for experimental operations. Such an approach is in itself both refreshing and novel, since so many chemists seem to forget, in their Aristotelian quest for knowledge, that chemistry deals with matter. It is a well-balanced textbook and should find wide and favorable acceptance.

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The Determination of Crystal Structures. H. Lipson and W. Cochran. vol. III of *The Crystalline State,* Lawrence Bragg, Ed. G. Bell, London; Macmillan, New York, 1953. ix + 345 pp. Illus. + plates. $8.

Lipson and Cochran's volume is the third of a series under the general title *The Crystalline State,* edited by Sir Lawrence Bragg. Two decades have passed since the appearance of the first volume, *A General Survey,* written by the editor himself, and the very great advances that have been made in x-ray analysis since Bragg's volume appeared are partly evidenced by a comparison of it with the present work. Volume II, *The Optical Principles of the Diffraction of X-Rays,* by R. W. James (1950), is chiefly devoted to the physics of x-ray scattering.

Lipson and Cochran have concerned themselves with the problems of structure determination "from the stage at which a set of structure amplitudes has been obtained to the final accurate positioning of the atoms." The treatment is practical throughout; matters that are not immediately applicable—for example, the full development of space-group theory—are omitted. The series of volumes does not provide a discussion of modern experimental methods; perhaps a review of these is contemplated in a future volume.

Here is a work of tremendous practical value to crystal-structure analysts; and at the outset, I express my personal admiration for the amount of material and experience that have been assembled and the splendid way in which the material is presented.

The work opens with a review of x-ray optics. A discussion of the results of space-group theory follows. The third and fourth chapters are concerned with techniques for computation of structure factors and Fourier series, respectively. The following four chap-

ters deal with structure deduction. The final chapter discusses the accuracy of x-ray structure analysis.

A crystallographer who reads this volume thoroughly will have covered a large sample of the experience of many years, the best of the art of structure analysis, and a splendid account of mathematical methods. Major emphasis is placed on the surmounting of the phase problem. The recently published monograph by Hauptman and Karle [*Solution of the Phase Problem,* A.C.A. Monogr. No. 3, Wilmington, Del. (1953)], which claims to present "a routine procedure for determining the phases of the structure factors which is valid for all centrosymmetric space groups," is in part erroneous—as Vand and I have shown [*Statistical Approach to X-Ray Structure Analysis,* Penn. State Univ. (1953)]. If it were not, most of Lipson and Cochran's book would be unnecessary. No general solution of the phase problem in x-ray analysis exists, as yet; thus this extremely important field still remains an art, which the present volume beautifully summarizes. It is extremely necessary that analysts not be discouraged from continuing their search for more powerful phase-determining methods. Until these are available, the present collation of available methods is of critical value.

As might be anticipated in a discussion of a field that is growing at a fast rate, which describes methods that are to some extent necessarily selected on the basis of personal preference, the authors occasionally weight certain techniques too much, and underemphasize or ignore others. On page 14, for example, the statement appears, in connection with the interpretation of Patterson syntheses, that "no general method of deducing atomic positions has yet been put forward that will work in any but the simplest crystals." A fairly extensive discussion in Chapter 6 tends to ameliorate this view, which is somewhat shortsighted. Present developments tend to suggest that Patterson-interpretation methods, and particularly those along the lines under development by M. J. Buerger, hold large hope for direct structure analysis. These already have some quite complex structures to their credit and can be shown to have operated successfully when all other known methods have apparently failed.

The discussion on pages 143–144 of the combined use of electron or neutron scattering in conjunction with x-ray scattering is very sketchy and occasionally incorrect and, in general, might have been given more thought. The difficulties of neutron single-crystal diffraction are much less than the authors suggest, and the potentialities of deuterium-hydrogen replacement, for example, are tremendously advantageous for structure-factor phase determination. On the other hand, comparison of x-ray and neutron scattering as a means of phase determination will in general be a difficult matter for structures composed of two or more kinds of atoms, since the x-ray data must be reduced to those for point scatterers if these are to be comparable to neutron data.

The treatment of homometric structures could have been extended, and warnings emphasized on the occurrence of near-homometric structures. An example of such a structure is that of triphenylene [A. Klug, *Acta Cryst.* 3, 165, 176 (1950)]. The published structure, which is remarkable for some reportedly very short intermolecular distances, is actually incorrect [V. Vand and R. Pepinsky, to be published]. Unfortunately this structure is used as an example of the successful application of the molecular transform method (pp. 230–233).

The statement on pages 174–175 that little is to be gained by subtraction of the origin peak in a three-dimensional Patterson is open to serious question. Examples can be presented in which such origin-peak removal is distinctly advantageous. The chief difficulty in origin-peak removal is that it can easily be performed incorrectly if proper care is not taken with the statistics of occurrence of reflections.

More could be said about the determination of noncentrosymmetric structures or structure projections, since these are becoming increasingly possible and important. Some discussion of the special problems of large-molecule analysis would have been advantageous, and it is rather surprising to find it missing.

More could be said, furthermore, about the determination of anisotropic temperature vibrations, the determination of bonding electron distribution, the location of hydrogen and other light atoms, and so forth. The important field of study of crystal transitions is omitted entirely.

The discussion of computing methods is excellent as far as it goes, but it omits important techniques that were surely known to the authors.

These are matters of small moment in a work that provides crystallographers with a wide collation and evaluation of practical structure-analytical methods. It is a volume for which we have long waited and are indeed grateful.

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Amebiasis. Ernest Carroll Faust. Charles C Thomas, Springfield, Ill., 1954. xi + 154 pp. Illus. $4.75.

This short 168-page monograph by a world authority on tropical diseases provides a clear and concise picture of amebiasis.

The author discusses in sequence geographic distribution, natural history, pathogenesis and pathology, manifestations and clinical evidence, diagnosis and treatment, and control. The chapters on manifestations and clinical evidence might have been combined with the chapter on diagnosis and treatment to make it easier to find the clinical picture, diagnosis, and treatment of the various forms of the disease in one section. Portions of these two chapters are redundant, and differential diagnosis is not adequately discussed.

The chapters on natural history and control, although interesting and well written, might have been shortened, and more space might have been allotted to a more critical presenation of the clinical picture