

248, ref. 26) and some formulas are incorrect; on p. 29, uridine phosphate and galactose + phosphate for uridine triphosphate and galactose 1-phosphate, on p. 156, *O*-methyl-*L*-tyrosine; on p. 223, second formula and on p. 272 the three formulas of the third sentence. In addition, articles are incorrectly referred to and statements are not supported by the experimental evidence. The values reported for the periodate oxidation of methyl *N*-acetyl-*D*-glucosaminide are in fact those of the oxidation of *D*-glucosamine (p. 193). The entering of groups in 2,3,1,6-dianhydro- β -*D*-talose, takes place in axial positions 2 and 3 (following Fürst and Plattner's rule), because it has been shown that the C-6 group is in axial position (configuration 1C of Reeves) (p. 196). No decarboxylation has been demonstrated during the oxidative degradation of *D*-glucosamine by ninhydrin (p. 204). The synthesis of 3,6-di-*O*-methylglucosamine has not been described in the paper referred to, but in a publication not referred to (p. 222). Addition of ammonia to methyl 2,3-anhydro-4,6-benzylidene- α -*D*-alloside gives the 3-amino-3-deoxyglucoside, in a 1% yield, the 2-amino-2-deoxyaltroside derivative being obtained in an over 60% yield (p. 270), whereas the possibility of anhydro formation accompanying the replacement of the tosyl group by the amino group in methyl tri-*O*-acetyl-3-*O*-tosyl- β -glucoside is in fact proved by the synthesis of the 3-amino-glucose derivative from both 2,3- and 3,4-anhydromethylallosides (p. 271). An incomplete check has shown the numbering of 13 references to be incorrect or absent. These inaccuracies mar a time-consuming and worthwhile work. It is to be hoped that a revised edition will correct what seems to be due to hasty work.

Despite its faults, the book of Kent and Whitehouse has its place on the shelf of all interested in connective tissue, blood group substances, bacterial polysaccharides, or more simply, in the chemistry and biochemistry of the amino-sugars. The authors have done an interesting job of correlating thoughts in many fields and have pointed out future lines of research.

MASSACHUSETTS GENERAL HOSPITAL
BOSTON 14, MASSACHUSETTS

ROGER W. JEANLOZ

The Chemistry of Synthetic Dyes and Pigments. American Chemical Society Monograph Series. Edited by H. A. LUBS, Organic Chemicals Department, E. I. du Pont de Nemours and Company. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1955. XIV + 734 pp. 16.5 X 23 cm. Price, \$18.50.

The last pre-war comprehensive treatise of synthetic dyes was Fierz-David's "Künstliche Organische Farbstoffe" (1926, supplement 1935) which, though not free of errors, was excellent from the didactic point of view. The last book in the English language was Thorpe-Linstead's "The Synthetic Dyestuffs" (1933) which, however, was much less complete than Fierz-David or Lubs. The "Colour Index" is obsolete and the last supplement to Schultz' "Farbstofftabellen" is also 16 years old. Thus the decision of the Editors of the American Chemical Society Monograph Series to fill this gap is welcome. The more so since, unfortunately, dye chemistry is not being taught at our universities and since we do not appreciate in this country that the dye industry has provided and is providing a reservoir of organic chemicals useful in many other branches of the synthetic industry. Under H. A. Lubs as Editor the book has been written by 19 experts from the staff of the du Pont Company.

The first very good chapter "Benzene Intermediates" (A. C. Stevenson) describes the fundamental reactions; while basing the factual information heavily on BIOS and FIAT reports, modern theories have been injected and the chapter is entirely up-to-date. The customary use of sulfuric acid in the manufacture of *N,N*-dimethylaniline should have been mentioned. The second equally good chapter "Naphthalene Intermediates" (H. M. Parmelee) deals with the substitution reactions and with specific important azo intermediates. More space should have been devoted to the process for making 3-hydroxy-2-naphthoic acid.

The third chapter deals with "Azo Dyes." S. N. Boyd discusses diazotization and coupling, H. E. Woodward cotton, wool and solvent-soluble dyes, J. F. Laucius disperse azo dyes. This is a well done and very readable treat-

ise of a somewhat dry subject. The reviewer missed the neutral dyeing metal complexes (Perlon Fast Dyes, Capracyls etc.). The chapter on "Azoic Dyes" (4, C. W. Maynard, Jr.) is excellent, as far as it goes. However, the preparation of the less common azoic bases, stabilizers and coupling components is not described and the reader would not find it in chapter 1 either.

The next chapter "Miscellaneous Dyes" (5, S. E. Kraehler) suffers from an illogical arrangement of otherwise well written sections. The closely related diarylmethane, triarylmethane, xanthene, acridine dyes and the indamine, indophenol, azine, oxazine, thiazine dyes should have been kept together and not separated by such extraneous subjects, as, e.g., nitro, quinoline, thiazole dyes. Homolka's commercially important New Fuchsin process is not mentioned. Fur and hair dyes would have deserved some space. The chapter on "Sulfur Dyes" (6, N. M. Bigelow and O. Stallman) is excellent.

The large chapter (7) on "Anthraquinone Dyes and Intermediates" (comprising nearly one-third of the book) starts with a rather condensed section (F. B. Stilmar and M. A. Perkins) dealing with the intermediates. Among the methods for manufacturing anthraquinone the reviewer missed the catalytic vapor phase oxidation of anthracene. The section on anthraquinone acid dyes (E. C. Buxbaum) is easy to read and provides a good and complete survey. The section on disperse dyes (C. F. Belcher) is rather brief. The damage caused by "gas fumes" is mentioned, but this so-called gas-fading is not described and the gas not identified. The short section on metallizable dyes (E. C. Buxbaum) fails to deal adequately with alizarine: the important history of the first synthesis of a naturally occurring dye is not given, the names of Graebe and Liebermann appear only in the references, the oxidative fusion of silver salt is not discussed. The use of boric acid in the Bohn-Schmidt reaction should have been mentioned.

It is in the excellent and long section on vat dyes (M. A. Perkins, F. B. Stilmar, M. S. Whelen) where this book attains its greatest usefulness and almost perfection. The reviewer would have omitted "almost" had the authors devoted more space to the important Jade Green (this popular name appears only in parentheses). Nawiasky's superior synthesis of isoviolanthrone going through the di-3-benzanthronyl sulfide should have been more emphasized. A section on the conditioning of vat dyes would have been welcome. But otherwise a very great material has been presented in a clear and concise form and this section on vat dyes alone makes the work a "must" on the bookshelf of the dye chemist. The chapter on "Indigoid Dyes" (8, A. J. Johnson) gives a very good condensed summary. The structure of Tyrian Purple was elucidated by Friedländer and not by Baeyer.

The chapters on "Phthalocyanine Pigments" (9, N. M. Bigelow, M. A. Perkins) and "Phthalocyanine Dyes" (10, W. S. Struve) have been kept somewhat out of proportion largely on purpose, and give a very complete picture of this relatively new field. The authors should not have hesitated to mention the trade name "Monastal Blue" under which copper phthalocyanine was first put on the market. In chapter 11 E. R. Allen discharged with remarkable skill the difficult task to cover on 36 pages the entire field of "Organic Pigments." The structures of phospho-tungstic and -molybdic acids, now well established by X-ray studies, should have been indicated in the section on permanent toners.

The chapter on "Color and Chemical Constitution of Dyes" (12, D. Graham) is a concise and modern treatment of the subject. It will be of greatest use to those who are familiar with the important dye structures; for the average reader references to other chapters would have been helpful. A list of "Common Names of Dye Intermediates" (13) and a quite complete "Critical Bibliography" (14, both by C. W. Maynard) are very useful and conclude the work.

The reviewer missed a chapter on "Optical Bleaches" which have attained considerable importance, particularly in our country. The choice of the trade names was by necessity somewhat arbitrary and not consistent. Whatever criticisms have been offered should not detract from the great value of this book, evidently the result of thorough, expert work. The print and the generous illustration by formulas are excellent; the price is adequate.

1049 KENYON AVENUE
PLAINFIELD, N. J.

HANS Z. LECHER