

## BOOK REVIEWS

**Principles of Color Technology.** FRED W. BILLMEYER, JR. and  
MAX SALTZMAN. Interscience, New York, 1966. x + 193. \$11.95.

The *Principles of Color Technology* is particularly directed to the problems of color measurement, specification, standardization, and matching as they arise in industry. The background of the two authors qualifies them to do the fine job they have in this book.

In addition to the information which is pertinent to present industrial problems, the book carries an important message from the authors. One cannot help but understand that color is a response to a stimulus which is the result of cooperative characteristics: a source of illumination; the spectral characteristics of a colorant; and the response of the eye.

This interrelationship of source, colorant, and eye is repeated frequently enough to make a lasting impression on the novice and to become somewhat disconcerting to those who already know this fundamental relationship. The diagram used by way of demonstration is reproduced throughout the book no fewer than twelve times. But the book was not meant to teach those who know, and it should succeed with those who approach the subject with little background.

The development of the subject, which is treated nonmathematically, proceeds logically through the chapters which discuss: (1) What is Color? (2) Color-order Systems, (3) Color Measurement, Specification and Tolerances, (4) Colorants, and (5) The Coloring of Materials in Industry. The book also includes a chapter on "Color Technology—Present and Future," and an extensive annotated bibliography.

This reviewer was pleased to see expressions of opinion, as well as a recitation of principles and techniques. On page 50, following the discussion of several approaches to a perceptually uniform color space, the authors state: "Sometimes we wonder exactly what a person would do, . . . , with a perfectly uniformly perceptual system if he had one."

There is no inconsistency between this opinion and the description of procedures for setting up practical tolerances as expressed on page 83: "The best way to set up proper limit standards is to select a large number of samples from actual production which show all the possible variations which may be expected from the process. Those samples may be separated into acceptable and non-acceptable material by as many qualified observers as are involved in the problem. Measurement of these samples, already separated into categories, will provide the coordinates which define the region of acceptable material." Note the use of the word "acceptable" with no reference to perceptibility.

The subject of color measurement is discussed from the point of view of matching a sample to a reference standard. This is one of the important practical problems for which measurement is required. For the measurement phase of the color matching problem, the authors emphasize (p. 55): "Whether a sample truly represents the material being examined is the first question to be asked before undertaking any color measurement, visual or instrumental." The authors then state (p. 126): ". . . for any coloring operation, the colorants must be selected and standardized so that they always give the same result when used in the same way."

The discussion of visual, colorimetric, and spectrophotometric evaluation of color is good. Especially useful is the discussion of instrument and observer metamerism, a phenomenon too often attributed solely to samples.

The book does have some errors of varying importance. Two that this reviewer considers worthy of mention are: (1) the definition of refractive index as stated under the diagram on page 8 is incorrect; (2) the diagram on page 75 depicting dispersion through a diffraction grating has the spectrum indicated in the wrong order. But these points do not detract from the value of the book.

For those familiar with the field, the collection of data and references to the literature will be found convenient. For those about to enter the field, this book presents a relatively simple approach without great sacrifices in content or treatment.

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