Procedures

Photomicrography. A Comprehensive Treatise. ROGER P. LOVELAND. Wiley, New York, 1970. In 2 vols. Vol. 1, xii pp. + pp. 1–526 + index; vol. 2, xiv pp. + pp. 527–1040 + index. $39.50. Wiley Series on Photographic Science and Technology and the Graphic Arts.

The subtitle of this book on the principles and practice of photomicrography, intended as a combination reference book and textbook, correctly indicates its thoroughness and careful preparation. For the most part the book is very well illustrated both with diagrams to explain optical phenomena and with examples of high quality micrographs of difficult subjects.

The book divides into three major sections: (i) an outline of the basic optical and physical aspects of photomicrography, including the characteristics of various illumination systems; (ii) a summary of many years' experience at Kodak Research Laboratories in the testing and evaluation of different procedures, instruments, and materials; and (iii) a detailed listing of technical information of the sort supplied by manufacturers with their products. There is much useful repetition so that the reader need not peruse the whole work to complete his study of a particular topic.

Loveland stresses the value of utilizing the full "spectrum" available for microscopy, by which he means phase contrast, interference, and holographic methods as well as the different wavelengths from infrared through ultraviolet. He attempts to be quantitative wherever possible, as for example in discussions of allowable mechanical and optical tolerances and the quality control implicit in standard grades of cover slips. The most significant subjects omitted are quantitative microscopy and stereology; both of these are increasing in importance, and it is to be hoped that they will be included in subsequent editions.

Many readers will learn to rely on Loveland's book as a ready source of such information as the spectral transparency of most types of filters and the characteristics of light sources, even including details about filament shape in incandescent lamps and the dependence of light output and bulb life on applied voltage. As is to be expected, the section on photographic materials is concerned largely with Kodak products, although the author does mention equivalent materials available from other sources.

Certainly the most personal portions of the book deal with matters of technique, and especially the importance of paying attention to detail at every stage, including preparation of the specimen, selection of the type of microscope, adjustment of the illuminating system, choice of film and processing procedure, and finally preparation of the inevitable projection slides. In this respect the book is almost unique, for few people have the experience to write with authority on all phases of the subject.

In summary, Loveland has achieved his goal of writing a comprehensive treatise that will be of value both to his professional colleagues and to scientists who only occasionally utilize optical methods to record and illustrate their observations.

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Heat Wastes and Pollution

Electric Power and Thermal Discharges. Thermal Considerations in the Production of Electric Power. A symposium, Washington, D.C., June 1970. MERRIL EISENBUD and GEORGE GLEASON, Eds. Gordon and Breach, New York, 1970. xxxii, 424 pp., illus. $22.50.

During the last few years there has been a variety of symposia dealing with electric power production and heated effluents. This symposium is one of the better examples in that it covers nearly all the principal considerations, from experimental biological effects to the use of river models to enforcement of water quality standards. One important subject it does not cover sufficiently is the consideration of biological populations existing currently below power plants, which may provide the real test of the degree of protection required and the accuracy of current water quality standards for heated discharges.

A group of papers dealing with a variety of water-cooling devices and systems is quite complete. The contributors not only present their ideas for these but also discuss relative costs, environmental impact, and potential future modifications. Site location problems and the need for long-range planning in coordination with appropriate regulatory agencies are well discussed. A consideration in long-range planning should be the possible beneficial uses of warm water discharges, which are discussed adequately in this book. This important topic is probably not being given proper consideration in actual power plant planning.

Unfortunately, there is an aura of pessimism in the symposium concerning possible significant improvements in power generation technology. The prospect of improvement in fossil-fuel and nuclear power generation is apparently minimal, and little hope is expressed for potential new techniques such as gas turbines, magnetohydrodynamics, and nuclear fusion processes. Such pessimism may be warranted, but much more effort ought to be made to develop solutions to power generation problems. Additional discussion of the potential feasibility of more, but smaller, power plants in the future would have been beneficial, if for no other reason than that they offer a way of reducing localized environmental impact and also transmission cost.

A wholesome and concerted effort is made to discuss thermal problems beyond the receiving water, which have rarely been mentioned in previous symposia. Several participants comment on heat balance for the earth and its atmosphere. Such far-ranging thought is essential now, before we become overly committed in the planning of power generation systems to be built in the last quarter of this century.

Most of the papers are well conceived and thorough. One by Hargis and Warinner could be considered almost a classic in the study of thermal effects on aquatic biological systems. These authors emphasize the implications of secondary effects of heat, such as reduction in oxygen-carrying capacity of heated water, increase in disease and parasite problems, and proliferation of undesirable aquatic plant and animal species. Such sublethal ecological changes can be important and difficult to ascertain in site surveys and seldom receive adequate attention.

In short, because of its scope and the thoroughness of the authors' contributions this symposium should be read by those concerned with power generation and the environment. One final, minor point is that the quality of the editing is not commensurate with the cost of the book.

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