
BOOK REVIEW

History of Staining, 3rd Edition, by George Clark and Frederick H. Kasten. Williams and Wilkins, Baltimore, 1983, x + 304 pages, \$29.95.

To many of us in histology and cytology the history of the development of our arcane lore is a matter of considerable interest. In the past it has been more properly the custom for the steadfast, curious, or intensely dedicated to pick up this background information—to the extent that it was available at all—piecemeal, with appreciable entropy. Understanding the history of one's business is not absolutely necessary, but it is enormously satisfying. Here we have a very well written book, with an extensive index, that continues the collaboration of Drs. George Clark and the late R.D. Lillie with Dr. F.H. Kasten, a longtime associate of Dr. Lillie and a distinguished histochemist/cell biologist in his own right. Some of the chapters bear the classic imprint of Dr. Lillie's orientation, but there have been welcome additions of new materials, plus the inclusion of more than 900 literature citations that are gathered for the first time into a comprehensive bibliography for quick reference use. Science historians and biologists in general who use and/or teach staining methods for the study of cells and tissues will find this book a valuable addition to their institutional and personal libraries.

As is fitting for a volume dedicated to Dr. Ralph Dougall Lillie, the first chapter is a detailed biography of this eminent staining expert and master histochemist. This section includes a complete bibliography of his many contributions and describes his pivotal role in the founding of the Histochemical Society, as well as his activities as a member of the Board of Trustees of the Biological Stain Commission.

Interspersed among the 23 other chapters of this book on the early biological usage of carmine (cochineal dyes), hematoxylin (logwood dyes), the discovery by Perkins of aniline dyes and their initial use in histology, bacteriology, and parasitology, are biographical profiles on the personalities, lives, and contributions of such 19th century pioneers in the field as von Gerlach, Heidenhain, Mayer, Unna, Ehrlich, Flemming, Belling, Mann, and Mallory. These succinct accounts are made all the more interesting by inclusion of a portrait of each of these scientists. Of particular note is the chapter on the development of cytological stains and the significant scien-

tific discoveries that followed application of synthetic dyes for chromatin staining, for it was here that the origins of the cell theory and many of the concepts of modern cell biology were first delineated. This recounting of the early history in the development of cell biology and the intertwining stories of cytological and biochemical discoveries during the latter half of the 19th century are clearly described in relation to the history of staining, giving the reader an excellent historical perspective on the relevance of concurrent growth in these two emerging disciplines. Chapter 24, on the history of nucleoprotein histochemistry, in itself is worth the modest price of this book. Your reviewer was particularly pleased with the sections on fluorescence microscopy, ultraviolet microscopy, the use of dyes as vital stains, and the development of nucleic acid and protein histo- and cytochemistry. These chapters are enriched with much interesting information on the major contributors to these fields such as Bommer, Haitinger, Strugger, Raspail, Hofmann, Hoppe-Seyler, Miescher, Kossel, and Feulgen. This volume will serve for many years as useful reference material for courses in histotechnology.

While more than 20 chapters on various aspects of the development of stains and staining methods carry us up to, but not including, flow cytometry and fluorescence-activated cell sorting, the section on the development of fluorescence microscopy provides an appropriate background for the origins of this modern technology. Although understandably considered by the authors to be beyond the scope of this book, the use of heavy metals for electron microscope cytochemistry is only briefly mentioned and there is but a single page devoted to immunocytochemistry. While the salient discoveries of Coons in the development and use of immunofluorescence are described in the chapter on fluorescence microscopy, the subject of immunocytochemistry itself is not developed to the extent that seems warranted by the current importance of these methods to many areas of research in cell biology and neuroendocrinology. Hopefully, the next revision will contain a more extensive section on recently introduced methods using immunoglobulin enzyme bridge methods and avidin-biotin localization procedures for in situ analysis of biologically significant cellular and tissue components.

My overall opinion is that this is a very good book indeed. It is well designed and carefully researched. It

should be a welcome addition to the library of those interested in stains and staining. For oldtimers, it gives a perspective of how the field has moved to where it now is; for newcomers, it offers a painless introduction to the history and use of stains and staining in biomedical research. One of the values of this book is that it allows one "to read the minutes of the last meeting," in a manner of speaking, and to appreciate the important discoveries of the past, as well as to anticipate those of the future in areas such as molecular biology and cell ultrastructure, whose genealogy can be traced to work of many of the pioneers in the history of staining.

Cell biologists, pathologists, hematologists, microbiologists, and technicians who use staining methods will

find this a fascinating and very readable account of the origins of many of the procedures that are now used daily in laboratories throughout the world. My own enthusiasm for this volume is demonstrated by the fact that I have already placed my order for a copy that will be a gift to the biomedical library of our institution, in addition to my own copy, which will remain in the departmental library as recommended reading for students in cytochemistry and cellular pathology.

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