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Bone Marrow Pathology

2ND EDITION

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To my wonderful family, who survived another edition.

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Bone Marrow Pathology

2ND EDITION

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My goal in writing this textbook was to identify, organize and illustrate current best practice of bone marrow pathology. I hope that the goal has been achieved, but I would also like to note that there are several factors that make this a difficult goal to attain. Perhaps most important, the explosion of literature in many fields of hematopathology means that best practice is a moving target. It is true that in a few areas of the specialty, facts are established, classification schemes are static, and the main challenge is to organize and illustrate what is known. In contrast, other areas of bone marrow pathology are extremely dynamic, with huge volumes of literature pertinent to diagnosis being published on a monthly basis. This literature is not just a “bone marrow” literature, but includes the output of basic science labs and the results of clinical trials of new treatments. As a consequence, the best practice of bone marrow interpretation is now an eclectic braid produced by combining the selected findings from multiple different highly specialized areas. Standard of care has been redefined to include integration of both “routine” and “esoteric” testing into a final diagnostic label. Given current book publishing technology and limitations of an author’s time, at some point this braid has to be declared “done,” with the resulting product representing a best effort to summarize best practice at a given point in time. Of course, there is no indication that the pace and volume of change will do anything but accelerate. For example, completion of this book coincided with the announcement of completion of a “rough draft” of the human genome. Time will tell whether, as some have predicted, this project will be more important to mankind than the invention of the wheel, but past experience would suggest that hematopathology is likely to be one of the fields where advancements in understanding of the details of how cells function will be quickly translated into a better understanding of how patients feel, function, survive, and respond to therapy. It can be anticipated that not only will classification systems be replaced, but there will be challenges to traditional methods of disease classification. Things that we now don’t know will become crystal clear, and things that we now know with certainty will be shown to be wrong. My view is that the highly trained hematopathologist will be in ever greater demand in this environment, but can there be any doubt that variable and flawed humans will be in competition with computers and automated instruments to see who will add the most value for the least cost? The good news is that the Enlightenment view that progress is inevitable is being confirmed. To paraphrase the poet John Masefield, changes in the practice of hematopathology are not “just one damn thing after another,” but seem to be actual improvements in interpretation linked to improvements in patient care and patient outcome. The bad news is that there is an increasingly narrow window between an up-to-date textbook of bone marrow pathology and a bone marrow history book.

Another limitation confronting this project is that the book reflects the literature, and the literature concentrates on

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Foreword

paradigm examples. However, many diseases occur along a spectrum, and outlier cases make up a small but significant percentage of any a busy practice. Some of these outlier cases may be in the process of evolving into standard examples of described diseases, but some are simply examples of abnormalities that have not been well characterized in current classification schemes. A textbook cannot describe all of these exceptions and variants because deviations from standard are simply too numerous, and because these types of cases have not been studied in an evidence based literature. *Bone Marrow Pathology* is designed to help the physician come to an empirically adequate interpretation of the findings in outlier cases, but cannot hope to completely standardize either the approach to or the interpretation of these cases.

Most of *Bone Marrow Pathology* is structured to answer the types of questions that arise during everyday sign out of bone marrow specimens, when a page or two of reading during the course of a busy day will be prompted by a specific question raised by the case at hand. If the text is successful, pathologists

with varying backgrounds and experience who refer to this text when they examine standard cases with identical features will come to identical conclusions, minimizing the gap between what we know as a specialty and what we do as individual practitioners. This edition also includes chapters on classification, decision making, and error. The latter three chapters are designed to prompt interest in these important but traditionally overlooked areas of diagnosis. It is obvious that a specialty is largely defined by the ability of its members to come to the same conclusions about identical cases, but achieving this diagnostic agreement is based on a common understanding of classification, decision making, and error.

Feedback about aspects of the book that do and don't work for you in your practice would be appreciated. The response to the first edition suggests that the book fills a diagnostic need, but it is inevitable that the book will contain outright mistakes and various failures of clarity. Just send word so that your feedback can be incorporated into the TEP (third edition project).

The completion of this second edition gives me the opportunity to thank the individuals instrumental in my career, as well as the people who generously provided support. My initial training in bone marrow pathology at the University of Minnesota was excellent, and I am very grateful to Drs Rob McKenna and Richard Brunning for all of their efforts on my behalf. Dr Robert Anderson, former chair of pathology in New Mexico, kindly helped me obtain a residency position at the University of Minnesota, and he later offered me a hematopathology position at a critical time in my career. This position at the University of New Mexico afforded me the opportunity to branch beyond traditional morphologic pathology, and to associate with a number of highly creative individuals, including Cheryl Willman. Other faculty have supported me during my 15-year tenure at the University of New Mexico, including my talented current chair, Mary Lipscomb, and my hematopathology/genetics colleagues Richard Larson, Catherine Leith, Karen Montgomery, Cordelia Sever, David Viswanatha, Thomas Williams, and Wilbur Williams.

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Joshua Weikersheimer, ASCP Press, included many original and artistic features in the first edition, and the second edition also has benefited greatly from his talent and good humor, along with excellent production support from Erik Tanck.

Finally, this book would not have been possible without the support and commitment of my husband, whose ideas and suggestions clearly influenced the content and emphasis of this book. Three coauthored chapters—classification, decision making, and error—are largely the product of his insights and analysis of these complex areas of pathology.

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