

BOOK REVIEW

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Review of: *Color Atlas and Manual of Microscopy for Criminalists, Chemists and Conservators*

REFERENCE: Petraco N, Kubic T. Color atlas and manual of microscopy for criminalists, chemists and conservators. CRC Press: Boca Raton, FL, 2003, 313 pp.

In their dedication, the authors of this ambitious volume express their appreciation to the late Dr. Walter C. McCrone for his inspiration that served to “convert (and) stimulate . . . these two disciples.” This reviewer worked closely with Walter McCrone for nearly 30 years and as a result feels justified in stating that McCrone (as he liked to call himself) would certainly be very proud of these “disciples” and the useful book that has resulted from their efforts that were driven, at least in part, by this inspiration.

This book appeals on several levels; it is very attractive for one. Color photomicrographs, photomacrographs, figures and illustrations are to be found on almost every page to a degree remarkable for a book produced in America. These serve to illustrate not only the microscopical appearance of microscopic objects but also to illustrate techniques of sample preparation and analysis. If it were less expensive (this should not be misinterpreted since it is certainly worth the price given the extensive use of high quality color illustrations throughout), forensic scientists might actually consider it as a coffee table book to impress and amaze their friends and neighbors with what we take for granted; a look into the microscopic world that lay people never even glimpse. Another notable feature is the range of topics covered. The book is divided into 14 chapters with four follow-up appendices that are actually mini-atlases that deal with human and animal hairs, synthetic fibers and paints and pigments.

The first chapter deals with basic light microscopy followed by a chapter on the stereomicroscope and the techniques of simple sample preparation. Chapter 3 is an introduction to polarized light microscopy. Chapter 4 is very short and only briefly discusses “Chemical Microscopy and Microtechnique” in one and a half pages of text. The next two chapters deal with human and animal hair identification and comparison, respectively. Chapters 7, 8, and 9 follow the same pattern with “Synthetic Fiber Identification” followed by “Natural Fiber Identification” and “Textile Examination.” “Paint Examination” is the subject of Chapter 10. “Soil and Mineral Examination” is the title of Chapter 11. “Gemstone Identification” follows as Chapter 12 and the technical chapters end with Chapter 13 entitled “Dust Examination.” The book concludes with a series of 23 short case studies that show, by example, the types

of problems that forensic microscopy can tackle and successfully help to solve. Many of the case studies are illustrated which keeps with the intensely *visual* nature of this work.

This book will probably be most useful to the new forensic microscopist and student both because of its elementary level of treatment of the subjects covered and of the “Wow” effect it will undoubtedly have on new trace evidence examiners who will not yet have seen many of these specimens at this early stage of their career, or if they have, probably not so well prepared and photographed. The text portions of each chapter are typically very short with emphasis on the photographs to explain topics in lieu of words. Many of the photos are extensively annotated (sometimes a little too much for this reviewer’s taste) which relieves some of the burden from the text. Experienced forensic microscopists or trace evidence examiners will want this book primarily for the sake of completeness, because they will find little here that is new to them. Many, if not all of these subjects are treated in greater depth in the monographs and reprints that form the core of the experienced scientist’s personal database. It is the rare personal library, however, that will have such books and articles that are better illustrated than this one.

For all its excellent features, some problems invariably creep into a book that covers as much ground as this one does. One notable problem has to do with the references which follow each chapter. We find, for example, at the conclusion of Chapter 6 (“Animal Hair Identification”) Glaister’s excellent (but long out-of-print) monograph listed twice both as Ref 4 and Ref 18. At the end of Chapter 11 (“Soil”), the old first edition of Murray and Tedrow is listed (Ref 2) instead of the newer 1992 second edition. The third edition (1946) of Feigl’s *Spot Tests* (instead of the much more recent differentiated editions) has somehow found its way into Chapter 1 (“Basic Light Microscopy”) as has Jungreis’ second edition (1997) of *Spot Tests*. One would have expected to find them among the references for Chapter 4 where, indeed, the older Feigl reference is also found but followed (Ref 11) by the 6th (and last) *Inorganic Spot Test* book. Jungreis, however, did not make this list of references. Lucy McCrone is referred to at the end of Chapter 1 as L. C. instead of her actual initials, L. B. Dorothy Catling (author of *Identification of Vegetable Fibres*) is referred to as Catlings.

The short texts that constitute each chapter are generally accurate as well as succinct. A notable exception is the perpetuation of the belief here that measurement of refractive indices is a useful

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means of identifying cellulosic fibers. Because all natural cellulose fibers consist of varying proportions of cellulose, lignocellulose and water, the measurement of their refractive indices is a function of the proportions of these substances to each other and the degree of fiber orientation. Since these fibers have variable moisture regain and their degree of orientation varies as much with maturity as with species, refractive indices can help little in telling us if we are dealing with linen (*Linum usitatissimum*) or true hemp (*Cannabis sativa*). In fact, refractive indices have been used in the past (before infrared spectroscopy) to determine the amount of water (moisture

regain) in such fibers. With regard to vegetable fibers, we might also mention the so-called "Modified Herzog Test" described by the authors. It is difficult to tell in what way Herzog's test has been modified.

In spite of some shortcomings, many of which will only be noticeable or irritating to the experienced microscopist, this is an excellent book that will be of constant use to the new microscopist and a resource for the experienced one. It is highly recommended for anyone who uses the microscope as an analytical tool to be frequently consulted and to be simply enjoyed for browsing.