

BOOK REVIEW

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Review of: *Practical Forensic Microscopy: A Laboratory Manual*

REFERENCE: Wheeler BP, Wilson LJ. **Practical forensic microscopy: a laboratory manual.** Hoboken, NJ: Wiley-Blackwell, 2008, 265 pp.

Microscopy is essential to virtually all of the forensic sciences. Therefore, training forensic scientists in various techniques of microscopy is a worthwhile endeavor. To that end, *Practical Forensic Microscopy* is justifiably offered as a comprehensive laboratory manual that adapts time-honored microscopical procedures used in the forensic laboratory into practical experiments that can be taught in college laboratories. The stated purpose is to bring forensic microscopy to the student so that forensic microscopy will continue to flourish.

The manual contains five chapters of introductory microscope experiments (stereomicroscope, compound microscope, polarizing microscope, fluorescence microscope, and phase contrast microscope); 16 chapters with application experiments (physical matches, constructions, lamp filaments, fingerprints, tool marks, firearms, shoe and tire prints, botanicals, paint, hairs, glass, fibers, soil, microchemical tests, controlled substances, and semen); and four chapters about instrumental microscopy (Fourier transform infrared microspectroscopy, UV-visible-NIR microspectrophotometry, thermal microscopy, and scanning electron microscopy). Each chapter introduces the subject in general terms followed by specific experiments; each of the 40 experiments has an objective followed by another introduction to the technique, list of equipment and supplies, safety considerations, report requirements, a short list of essay questions, and recommended readings. The book is unique; I do not know of any others like it. The only other laboratory manual that could be considered comparable is *Forensic Science Laboratory Manual and Workbook*, 3rd Edition, by Thomas Kubic and Nicholas Petraco although their manual is much broader in scope.

Although remarkably comprehensive and useful, the manual has some shortcomings. The compound biological microscope is introduced in Chapter 2; however, experiments in the chapter regarding centering the objectives and use of a Bertrand lens will be confusing to the user of a biological microscope because they apply to a

polarizing light microscope with a circular stage not introduced until Chapter 3. In Chapter 5 about the phase contrast microscope, the student will likely be left in a quandary again without any instruction on how to look at the objective back focal plane in order to center the phase annulus and plate. Unfortunately, there is no introductory chapter about the comparison microscope (an essential forensic tool); the comparison microscope is first introduced, only briefly, in Chapter 10, Tool Mark Examinations. In Chapters 9 (fingerprints) and 12 (shoe and tire prints), the reader is led to believe that these examinations are made with a stereomicroscope instead of hand-held magnifiers which are more commonly used. A beginning chapter on magnifiers would be a logical addition to the manual.

This book cannot stand alone as a forensic science text; it requires a companion text with more accurate explanations of all aspects of the forensic techniques included in the laboratory manual. As just one example, the illustrations of the compound and polarizing microscopes include numbered arrows pointing to the parts of the microscope; the student is asked to describe the parts. Nowhere is there a list from which the student can learn the names and functions of the parts.

Nevertheless, there are several novel, useful experiments like: the use of mixtures of clove and olive oil to illustrate refractive index measurements; the use of a polyester fiber to determine vibration direction of the polarizer; and using playing cards to illustrate physical matches. Simple drawings in most of the chapters are very instructive. In nearly all experiments, the students are asked to make their own drawings, which is good practice.

I recommend *Practical Forensic Microscopy* for colleges and universities which might otherwise struggle with developing laboratory courses that adequately teach the knowledge and skills necessary for trace evidence examiners. In addition, most newly hired forensic scientists do not arrive at the crime laboratory with a solid background in microscopy because most college curricula do not include much microscopy. Therefore, *Practical Forensic Microscopy* could also be used as part of a forensic examiner's initial professional training.

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