

BOOK REVIEW

Jay A. Siegel¹

A Review of “*Forensic Geology*”

REFERENCE: Murray, Raymond C. and Tedrow, John C. F., *Forensic Geology*, Prentice Hall, Englewood Cliffs, New Jersey, 1992.

This book is a rewrite of a book written in 1975 by the same authors, entitled “*Forensic Geology: Earth Sciences and Criminal Investigation.*” At the time this was practically the only treatise on the *forensic* aspects of geology. Surprisingly, this remains the case today with this 1992 edition.

The authors have written this book for three audiences. The first is forensic chemists, attorneys and law enforcement officers. The second is professional geologists. The authors hope that this book will stimulate new research and ideas from professionals. The third audience is practicing or potential forensic geologists. Although these audiences are diverse, the book succeeds admirably in reaching all three groups. The book conveys the basic language of geology and soil science, the diverse applications of geology to forensic science problems and a solid background in methods and problems. The authors illustrate their points liberally with real cases which lends a sense of credibility and reality not often found in textbooks or handbooks.

The book contains nine chapters, each of which is briefly described as follows.

An example of use of the survey’s answers is shown in Chapter 4 where the author summarizes the eight categories of methodology for keeping current:

Chapter 1, *History—Sherlock Holmes to the Present*, briefly describes the history of forensic science and how soil analysis developed along the way. Early and modern cases in which soil analysis was used to provide illustrations of the development of soil analysis.

Chapter 2, *Physical Evidence Using Earth Materials*, describes the types of evidence and cases that arise from soil and other earth materials. A brief description of how soil is transported and some of the different types of soil is also given.

Chapter 3, *Origin, Properties and Distribution of Earth Materials*, is a basic discussion of mineral types and crystallography. Rock types and particle size gradients are also covered.

Chapter 4, *Origin and Properties of Soil and Soil Material*, gets into soil proper. It is

¹Professor, School of Criminal Justice, Michigan State University, East Lansing, MI 48824.

an excellent discussion of the formation and types of soil based upon particle size. Distributions and variations in soil location and strata are also covered.

Chapter 5, *Artificial and Commercial Earth Materials*, covers such topics as glass, safe insulation, building materials, cosmetics and industrial abrasives.

Chapter 6, *Sampling for Forensic Examination*, discusses considerations involved in taking questioned and control samples. In addition, the principles of soil collection methods are covered. The important topic of the physical and chemical effects of soil drying is explained.

Chapter 7, *Comparison Methods in Forensic Geology*, covers color, density distribution and size distribution. There is also discussion of the use of the stereoscopic and petrographic microscopes. Sectioning and identification of minerals by refractive index, luminescence, electron microscopy, x-ray diffraction and differential thermal analysis are discussed. The level of sophistication is such that nonscientists can easily understand the principles. Chemical methods are also covered. They include: fusion analysis, moisture content, ignition tests, and instrumental methods including s-ray fluorescence, emission, atomic absorption, IR, nuclear activation and ion exchange. This chapter has a rather unique section on the analysis of fertilizer residues. Finally, soil acidity and pH and electrical conductivity of soils are discussed.

Chapter 8, *Geologic and Geophysical Instruments and Information*, discusses soil science and analysis from the geologist's (as opposed to chemist's) point of view. The chapter is a survey of methods such as fluorescence, the influence of water currents and the use of aerial photography. Other instruments such as the magnetometer are also discussed.

Chapter 9, *Practicing Forensic Geology*, is a compilation of cases that involved soil as an important type of evidence. The chapter also reviews some recent studies that evaluate methods for soil comparison. These include some suggested examination schemes. Finally there is some speculation on the future of soil science.

The book concludes with an extensive glossary of terms.

The book fills the need for an introductory treatise on the topic of forensic soil analysis. It is not meant to be a comprehensive treatment of geology but is quite useful for forensic applications. It is also extremely readable—clear and concise.