

BOOK REVIEW

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A Review of "Forensic Geology"

REFERENCE: Murray, Raymond C. and Tedrow, John C. F., *Forensic Geology*, Rutgers Univ. Press, New Brunswick, N.J., 1975, 217 pages \$12.50.

Soil and mineral evidence is encountered with moderate frequency in civil and criminal investigations. In recognition of this fact, the text in question attempts to depict the state of the art in the forensic characterization of geological materials. A tripartite audience is intended by the authors: (1) criminalists, (2) attorneys, both prosecuting and defense, and (3) geologists and soil scientists who may wish to become involved with the forensic area. Since each of these three groups will approach this book with different backgrounds and expectations, it is to be expected that each group will respond to the text in a somewhat different manner.

For the soil scientist or geologist, the book will provide an introduction to the problems unique to the forensic domain, for example, problems of sampling, maintenance of the integrity of the sample, and integration of the geological evidence with other types of evidence. The geologist and soil scientist will, of course, be conversant with the techniques used to characterize soil and mineral evidence, but may otherwise be unaware of these other factors; this text will provide much meaningful information which will aid them in their entry into the forensic arena.

The text will also prove very useful to the attorney wishing to become familiar with geological evidence. The text will probably serve this audience best of the three. The text is succinct, comprehensive, and accessible to those with little scientific training. One possible problem exists, however. The text discusses a number of techniques which have potential value for the characterization of geological evidence but which are rarely, if ever, attempted. A partial listing of these includes determinations of ion-exchange capacity, moisture, conductivity, redox potential, and weight loss on ignition. The text does not discuss the relative merits of these techniques from a forensic standpoint and does not sufficiently convey in some instances the fact that the applicability of these tests to forensic situations will often be severely limited by sample size and by an insufficient data base for the interpretation of the forensic significance of the data. It is perhaps unfair to whet the appetite of the attorney with an array of these techniques. If the attorney, in most cases not a scientist, develops the notion that all of the techniques mentioned are equally applicable or easily interpreted, he is likely to be disappointed.

For the criminalist, the text should prove very useful in several aspects. For the criminalist testifying to the comparison of soil evidence, the text provides an immensely readable discussion of the stratification of the regolith, the development of soil horizons, the

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formation of clay minerals, and the differentiation of igneous, metamorphic, and sedimentary rock. In short, the text provides a valuable model for a basis of the uniqueness of soil evidence and will aid the criminalist in preparing for court testimony.

In addition, the authors have given full recognition to the fact that soil and mineral evidence may be encountered in conjunction with various other types of evidence such as pollen, fossils, glass, safe insulation, building materials, and other detritus. The interrelationships of these types of evidence to geological evidence are thoroughly discussed, and many examples of actual case situations are presented to illustrate the types of issues involved.

Another service to the criminalist which this text will provide is to narrow the gap between the soil scientist and the forensic scientist. Progress in the forensic characterization of soil and mineral evidence has not kept pace with the progress made by geologists and soil scientists in their own respective areas. Many of these newer techniques will require additional development before they can be used in forensic situations, but it is likely that when such work is accomplished it will be performed by forensic scientists. This text serves as an annunciator of sophisticated techniques which, given additional consideration and research, may be adapted to forensic considerations.

This reviewer has but one criticism of the book. Clearly one of the major problems with soil evidence at the present time is that the interpretation of conventional techniques is rather subjective and in many instances rather difficult. In view of their expertise, it is unfortunate that Professors Murray and Tedrow have not attempted to critically review the techniques which are now used in forensic laboratories. For example, the characterization of soil on the basis of a density gradient column and on the basis of color, two of the principal techniques currently employed, is treated very sketchily in the book. In the opinion of this reviewer, a critical assessment of these and other techniques would have been welcomed by all three of the intended audiences.

The textbook is, however, a long-awaited work covering an important area of physical evidence. Furthermore, it covers the area well. It should prove to be a valuable contribution to the forensic literature.