

BOOK REVIEW

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Review of: *Fire Investigation*

REFERENCE: Nic Daéid, N, editor. *Fire investigation*, CRC Press, Boca Raton, Florida, 2004, 230 pp.

The newest addition to the fire investigation bookshelf comes from a very different perspective, at least for American readers. Edited by Niamh Nic Daéid, Senior Lecturer in the Forensic Science Unit at the University of Strathclyde in Glasgow (who herself has considerable expertise in various aspects of fire investigation), the book draws upon first-class subject experts to write about what they know best. In British practice, the laboratory-based forensic scientist is often directly involved in many more aspects of fire investigations than in the U.S. From scene investigation and cause and origin determination to the identification of materials and ignition processes, and testing of materials in both accidental and intentionally set fires, the forensic lab is called upon by public- and private sector investigators. In the U.S. the forensic lab analyst is most often charged only with fire debris analysis, with fire and police investigators doing nearly everything else.

Dr. Nic Daéid introduces the reader of this text to the basics of materials, fuels, combustion, fire growth and flame spread in a readable, non-technical, yet fairly comprehensive fashion. Dr. Caroline Maguire, a well-known independent fire consultant from Ireland, discusses various fuels and their properties, expanding on some of the concepts from Chapter 1. There are numerous short case histories illustrating accidental ignition processes along with comments about scene investigations and experiments carried out by the author and her colleagues. Many of the experiments and some of the technical data are, sadly, not referenced to citations in published sources so their value may be limited as sources in court proceedings. Most of the standards and practices described are based on British Standards Institution publications with no cross-references to American counterparts. While some of the terms and details of construction will be strange to American readers, the investigations and situations come from a wide variety of accidental causes that occur on both sides of the Atlantic. They will be useful and informative to most fire investigators.

John Twibell is one of the best forensic scientists engaged in the fire specialties and has contributed techniques ranging from lab analysis of volatile accelerants to electrical equipment over a span of more than 30 years. His chapter focuses, naturally, on British electrical practices. While the terms and practices may be different from U.S. use, the basics of electricity and its contributions

to fire causation are well presented and very useful to all investigators. Twibell includes some illustrative case studies as well as lab demonstrations of ignition processes.

Few people are as well qualified to write about fire testing and its application to fire investigation and reconstruction as Martin Shipp of the Fire Research Station, Building Research Establishment, at Garston, U.K. He has been involved in investigations, large and small, for many years and has employed a wide variety of tests, demonstrations and reconstructions to solve their puzzles. He offers a thorough discussion of the issues of testing and reconstruction—application, design and analysis. There is also a brief, but worthwhile, discussion of computer fire models, their applications and their validity and interpretation. There is an appended list of British Standard tests that can answer specific tests and a list of fire testing labs (with contact information) available in the U.K. He can be forgiven for including an expanded description of the capabilities and services of his own FRS facilities.

Reta Newman is very well known for her own co-authorship of the landmark reference *GC-MS Guide to Ignitable Liquids* and her extensive teaching of fire debris analysis topics. She gives in this chapter a very readable description of the isolation methods in use today in fire debris analysis. She does not, however, include reference to the ASTM practices she describes. This may be due to sensitivity about too many references to “American methodology” or an absence of similar British standards, but it is useful to readers to know that the methods she describes are not some casual lab innovation but thoroughly peer-reviewed methods.

Ms. Newman’s following chapter on interpretation of GC/MS data may be where most American fire investigators will lose the plot and forego further reading. There is, however, a nicely presented description of nomenclature and organic chemical structure that leads to a description of various “ignitable liquids.” (There appears to be no definition of this American term of art as a class of liquid fuels that includes both flammable liquids with flashpoints below 38°C and combustible liquids with flashpoints above 38°C.) The GC/MS method description is well done, but most readers without suitable chemistry background will still find it hard going. There are good descriptions of the newer classes of petroleum products that appear so often today and a fine discussion of interfering “background” or matrix contributions. It only lacks a discussion of detection limits and significant levels.

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Eric Stauffer has done some landmark research into matrix interferences in fire debris, in part due to his graduate thesis research but also in subsequent casework. The chemical analysis of fire debris is rarely straightforward because suspected volatile accelerants are nearly always present in fire debris that is contributing its own heady and complex blend of volatile combustion and pyrolysis products. Stauffer offers a comprehensive discussion of the chemistry of combustion and pyrolysis to explain the sources of interfering products and why comparison samples (of “background” or “matrix” substrates) are so important. The chemistry aspects will intimidate many fire investigators (maybe even some fire debris

analysts), but it is useful information that is not available elsewhere in a textbook.

This book is intentionally written from the British perspective. It is badly needed since the only parallel book, Cooke and Ide, *Principles of Fire Investigation*, while still in print (since 1984), is badly dated and in serious need of revision. This worthy effort was deliberately designed to address the needs of scientific fire investigators whose responsibilities cover a wide range and successfully fulfills that aim. By selecting a panel of first-class subject experts and drawing them together in a useful and readable text, Niamh has rendered a useful service to fire investigators.