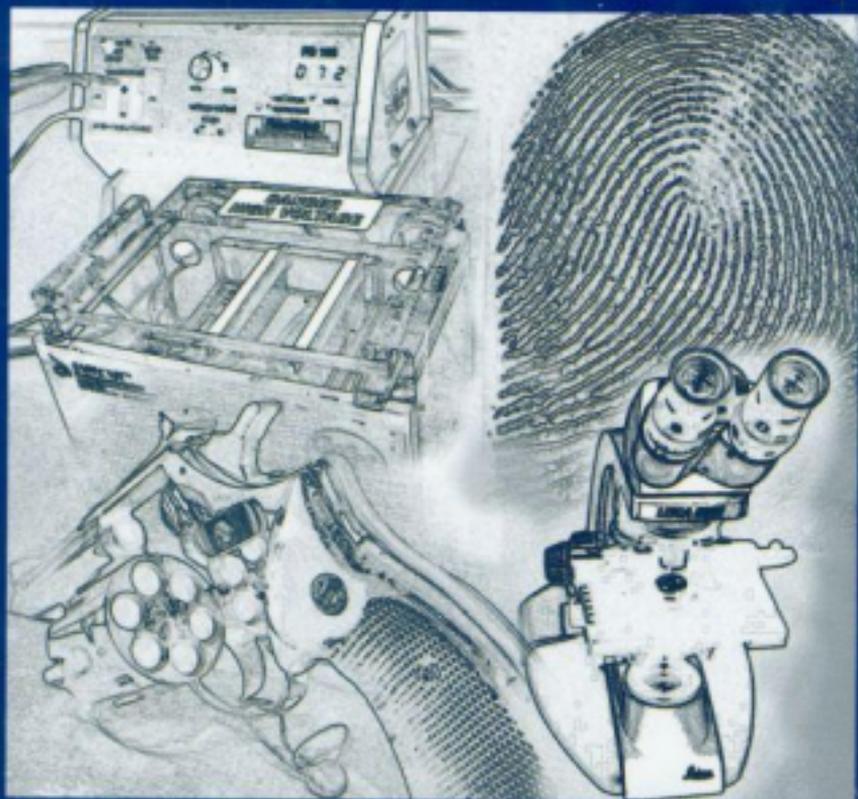


JOHN C. BRENNER

Forensic Science

An Illustrated Dictionary



CRC PRESS

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Preface

Forensic Science — An Illustrated Dictionary introduces terms commonly used in the field of forensic science to members of the law enforcement community, students taking courses in forensic science or criminal justice, and prosecutors and defense attorneys involved in criminal court cases. Knowing the meanings of these forensic terms becomes crucial in understanding and communicating with forensic scientists. The results of the forensic scientist's findings from the analysis of evidence are conveyed in a laboratory report, which to a nonscientist contains unfamiliar and unusual forensic terms. Knowing the definitions of those laboratory terms will aid in the interpretation and understanding of the laboratory report findings.

The field of forensics is a very diverse, exciting, and sometimes confusing science. *Forensic Science — An Illustrated Dictionary* is designed to explain difficult forensic terms. The definitions, along with the use of illustrations associated with certain forensic terms, will give the nonscientist a better understanding of those terms. The use of forensic laboratories has become an integral part of most criminal investigations. The investigators and the attorneys need to understand these forensic terms when either talking to the forensic scientist or reading the scientist's forensic laboratory reports.

In recent years Hollywood has produced several television shows about crime fighters. Although the story lines may be glamorized, the forensic science portions of these programs use many of the terms found and illustrated in this text.

This second edition has greatly expanded the number of forensic science terms from the previous book, the *Forensic Science Glossary*. The field of forensics has grown tremendously since the last edition. With the introduction of advanced procedures and methods of analysis, many new terms and words have emerged. *Forensic Science — An Illustrated Dictionary* has added many of these new forensic words used in criminal court cases, forensic entomology and forensic psychiatry, forensic interviewing of children, as well as crime scene reconstruction, to mention a few. Though this book is limited to forensic science, *Forensic Science — An Illustrated Dictionary* will become a tremendous and valuable reference book to a new court reporter typing his/her first homicide trial, a new assistant district attorney preparing for his/her first rape/murder trial, or even a high school or college student who has an interest in the field of forensic science. Using this book to either look up forensic terms or study the illustrations will give the layperson a better understanding of how exciting, unique, and complicated the field of forensic science can be.

The Author

John C. Brenner, while serving full time in the U.S. Navy, earned a B.S. in Health Care Administration from the University of Southern Illinois. Upon completion of his naval career he began his education in the field of forensic science, receiving an M.S. in Forensic Science from the University of New Haven Connecticut. He is a member of the Northeastern Association of Forensic Scientists (NEAFS). Mr. Brenner has spent 20 years as a forensic scientist with the New York State Police, having been trained in toxicology, serology, and DNA analysis. While providing testimony for more than 160 criminal court cases including homicides, rapes, blood assaults, burglaries, and DWIs, the author developed the idea for his first book, *Forensic Science Glossary*. Developing *Forensic Science — An Illustrated Dictionary* is one way of giving something back to the forensic community for the knowledge and experience he has gained working in the field of forensics.

Acknowledgments

Being a Christian man I know that my talents and ideas come from God. I want to thank Him for giving me the idea for this book and for the great interest I have in the field of forensic science.

Although only one name appears on the cover as the author, many people contributed to making this book a reality. Members of the New York State Police, such as Inspector Gerald Zeosky, who allowed me to take several pictures of laboratory instruments at the Forensic Investigation Center, Sr. Investigators Terrence Mullen and Tom Martin from the firearms section, T/Sgt. Craig Grazier, T/Sgt. James Campbell, and T/Sgt. Dennis Lyons, as well as Investigators John Egan and Drew McDonald from the Troop G Forensic Investigation Unit (FIU) all provided pictures and information for this book.

Michael Sikirica, M.D. and Susan LaCombe provided excellent autopsy pictures, and Dawn Flansburgh looked over the entire manuscript, checking the spelling and grammar.

With the encouragement of Becky McEldowney, CRC Press senior editor of life science, and her staff I was able to put together a much more expanded version of the *Forensic Science Glossary*, now including additional disciplines in the field of forensic science.

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Bibliography

A

A Single-letter designation of the purine base adenine.

AAFS American Academy of Forensic Sciences. The oversight body for certification of criminalists.

Abandonment A parent or caregiver leaving a child without adequate supervision or provision for the child's needs for an excessive period. State laws vary in defining adequacy of supervision and the length of time a child may be left alone or in the care of another before abandonment is determined to have occurred. The age of the child is an important factor.

ABFO (American Board of Forensic Odontology) scales An L-shaped piece of plastic used in photography that is marked with circles, black-and-white bars, and 18% gray bars to assist in distortion compensation and provide exposure determination. For measurement, the plastic piece is marked in millimeters.

Abrasion A skin injury caused by scraping off of superficial skin due to friction against a rough surface.

Absorbance The measure of concentration of material present; the negative log (base 10) of transmittance [$-\log 1/T$] of product of extinction coefficient, path length, and concentration, written as $A = Ebc$.

***Absorption** The incorporation of liquids or gases into the body. Absorption is also the process by which liquid hazardous materials are soaked up by sand, sawdust, or other material to limit the spread of contamination. A mechanical phenomenon wherein one substance penetrates into the inner structure of another, as in absorbent cotton or a sponge. An optical phenomenon wherein atoms or molecules block or attenuate the transmission of a beam of electromagnetic radiation.

Absorption band A region of the absorption spectrum in which the absorbance passes through a maximum point.

Absorption elution An improved, direct way of showing the presence of agglutinogens. In this method, antigenic material is first allowed to come in contact with antisera. The homologous antibody is specifically absorbed by a given agglutinin.

Absorption inhibition A classical, indirect way of demonstrating the presence of an agglutinin. This method involves the addition of a tittered anti-serum to the bloodstain.

Absorption spectrum A plot, or other representation of absorbance, or any function of absorbance, against wavelength, or any function of wavelength.

Absortivity (a) Absorbance divided by the product of the sample pathlength (b) and the concentration of the absorbing substance (c); $a = A/bc$.

- Abuse excuse** A legal tactic by which a person charged with a crime claims that past victimization justified his or her retaliation.
- Abused child** Any person under the age of 18 years, in the charge of a caregiver, who is physically or emotionally harmed by the caregiver's act or omission; also known as *maltreated child*.
- Accelerant** Any material used to initiate or promote the spread of a fire. The most common accelerants are flammable or combustible fluids. Whether a substance is an accelerant depends not on its chemical structure, but on its use. An accelerant may be a solid, liquid, or in some instances, a gas.
- Acceleration marks** Marks that are just the opposite of skid marks. The tires are being rotated by the axle and when done fast enough, the outside of the tire, the tread, takes time to catch up to the rest of the tire, which is being held by the coefficient of friction between the tires and the road surface. Therefore, the acceleration marks are heavy at the beginning and lighten up as the tire tread catches up.
- Accclimate** To become accustomed to a different climate or environment.
- Accommodation of sexual maltreatment** Process by which a child attempts to cope with sexual maltreatment. The child may dissociate from her or his body, pretend that nothing has happened, and fail to disclose the maltreatment, deny the maltreatment, delay disclosing the maltreatment, or recant a disclosure.
- Accomplice** A person who knowingly and voluntarily unites with the principal offender in a criminal act through aiding, abetting, advising, or encouraging the offender.
- Accountability** The quality of subordinate workers being responsible for their own work and answerable to a superior.
- Accreditation** (1) A formal process by which a laboratory is evaluated, with respect to established criteria, for its competence to perform a specified kind of measurement; (2) the decision based upon such a process; (3) formal recognition that a testing laboratory is competent to carry out specific tests or specific types of tests. [(3) – ISO Guide 2 1986 (E/F/R)].
- Accuracy** Closeness of the agreement between the result of a measurement and a true value of the measured quantity.
- Acetaldehyde (CH₃CHO)** A colorless liquid having a pungent and fruity odor; highly flammable and toxic, used chiefly to manufacture acetic acid. The first product of ethanol metabolism. Also known as *ethanol*.
- Acetate** A salt or ester of acetic acid. A manufactured fiber in which the fiber-forming substance is called *cellulose acetate*. Where not less than 92% of the hydroxyl groups are acetylated, the term triacetate may be used as a generic description of the fiber.
- Acetone** The simplest ketone. A solvent for gunpowder. A highly flammable, water-soluble solvent.
- Acid phosphatase** An enzyme found in high concentration in seminal fluid. Any nonspecific phosphatase requiring an acid medium for optimum activity.