

- AAS** Atomic absorption spectroscopy. A technique for metal analysis utilizing the reduction of a metal in solution to an atom, usually by a flame.
- ABC** American Board of Criminalistics.
- ABO** Human antigenic system designating the blood groups A, B, AB, and O.
- A.C.E.V.** Four steps (analysis, comparison, evaluation, and verification) followed to evaluate and identify a latent fingerprint according to Ashbaugh; accepted widely in the latent fingerprint examiner community. Sometimes pronounced *ace vee*.
- Acid phosphatase** Enzyme group that catalyzes the hydrolysis of certain organic phosphates. Seminal acid phosphatase (SAP) is produced in the prostate gland and serves as a presumptive test for semen.
- Accelerant** Agent, often an ignitable liquid, that acts to initiate a fire or increase its rate of spread.
- Accreditation** Endorsement of policies and procedures.
- Accuracy** Ability of a measurement to match the value of the quantity measured; correctness.
- Adenine (A)** One of the four nucleotide bases in DNA. The others are cytosine, guanine, and thymine.
- Adiabatic flame temperature** Theoretically, the highest temperature at which a fuel can burn. It is derived mathematically. Because certain combustion products tend to disassociate at high temperatures, the true maximum burning temperature, even under ideal conditions, is usually slightly lower.
- Adjudicated** Settled in a court of law.
- Adulterant** Material used to increase the mass of a controlled substance. Adulterants produce physiological effects and give the illusion that more controlled substance is present than actually is.
- AFIS** Automated fingerprint identification system.
- Agar (agarose)** Multiple sugar (polysaccharide) extracted from seaweed used to make the gel that supports DNA fragments during separation.
- Agglutination** A clumping of red cells by an antibody specific for characteristics on the red cell.
- Algor mortis** The postmortem cooling of the body.
- Alkaloid** Substance formed in the plant tissues and in the bodies of animals. Morphine and codeine are alkaloids of opium.
- Allele** One of two alternate forms of a gene occurring at a locus on homologous chromosomes.
- Allele frequency** Percentage of total gene copies of one type in a population. For example, a population of 100 people will include 200 alleles. If 80 are of one type, the allele frequency is 80/200 or 40/100 or 40 percent.
- Allelic marker** Allele form of a gene used to identify chromosomal segments suspected of association with a certain phenotype. For example, allelic markers may be used with a family pedigree in which a phenotype is common to identify chromosomal segments that contain the gene responsible for the phenotype.
- Allometry** The growth of part of the body in relation to the growth of the whole. The adjective form is *allometric*.
- Allozyme** Genetically determined allelic form of enzyme.
- Alteration** Change of a written or printed portion of a document, usually accomplished after obliterating or masking the original information.

Alu repeat Very common (100,000+ copies per genome) short interspersed nuclear element (SINE) found in humans and other primates.

Alveolus The bony socket in either the maxilla or mandible that holds the tooth.

Amphetamine A controlled substance along with its analogs, such as methamphetamine that creates an excitatory condition (stimulation), state of wakefulness, and euphoria.

Amplicon Product of the amplification of DNA or RNA.

Amylase The proteolytic enzyme found only in salivary and pancreatic secretions.

Anagen stage The growth period of hair.

Angle of impact Acute or internal angle formed by the direction of a blood drop and the plane of the surface it strikes.

Anion A negatively charged ion which will migrate toward the anode in an electric field.

Annealing Pairing of complementary strands of dot-blot DNA analysis (DQ-alpha and amplitype PM).

Anode A positive electrode.

Antemortem Pre-death.

Antibody An immunoglobulin molecule with specific receptor sites formed in response to an antigen.

Antigen A substance which can stimulate an immune response when introduced into a host.

Anthropometry Method of identification, devised by Alphonse Bertillon in the late 19th century, consisting of a set of body measurements thought to form a unique profile. The system has been obsolete for a century, but is an important precursor of fingerprint identification.

Aorta Largest artery in the body. It receives blood from the left ventricle of the heart and distributes it to smaller arteries that supply the entire body with blood.

Aperture Opening into a cavity, for example, a nasal aperture or a camera aperture.

Aqueous Made from or containing water.

Area of origin, fire-related General area where a fire started. This term is used when a fire originates in a large area or when the exact point of origin cannot be determined.

Arterial spurting (or gushing) Bloodstain patterns resulting from blood exiting the body under pressure from a breached artery.

Assault rifle Automatic weapon designed to be fired by one man. Ammunition is fed from a magazine.

Association Establishment of a relationship between objects (evidence and other items) through examination.

Associative evidence Evidence that associates individuals or objects to a crime scene.

Atomic absorption spectroscopy Quantitative analysis technique based on the absorption of light by a vaporized and atomized element.

Atomic emission spectroscopy Technique based on the emission of light by excited, vaporized, and atomized elements. Excitation can arise from any of a number of energy sources. The instruments are usually polychromatic devices. The method is most useful for quantitative analysis; qualitative use is also popular.

Atomic mass spectroscopy Technique based on detection of vaporized and atomized elements and their ionized isotopes. The detection and display of the spectra are based on the mass-to-charge ratios of the ions. The method is specific for qualitative analysis and also valuable for quantitative analysis.

Auricular surface Part of the ilium (upper pelvic bone) that forms a joint with the sacrum.

Autoerotic fatality Death occurring during solo sexual activity. Such deaths are accidental and most often involve hanging.

Automatic rifle Light machine gun in which the ammunition is fed from a magazine.

Automatic weapon Firearm that continues to fire as long as its trigger is depressed and ammunition is available.

Autoradiogram X-ray film image of DNA fragments or bands identified by labeled DNA molecules (probes). An autoradiogram is used for visual comparison and computer-assisted sizing of fragments.

Autosomal Refers to all chromosomes except the sex chromosomes.

Autosome Any of the 22 chromosomes (long, independent DNA molecules) not involved in sex determination.

Avulse Expel or remove.

Avulsed Expelled or removed.

Axial illumination Narrow nonangular illumination surrounding the optical axis of a transmitted light microscope, produced by a low numerical aperture setting of the condenser. It improves contrast and allows more accurate and precise determination of refractive indices by immersion methods and causes a decrease in resolving power.

Azostix™ Commercial test strip for detecting urea in blood by measuring the shift in pH resulting when urea is catalyzed to ammonia and carbon dioxide by urease. Used forensically to detect urine.

Back spatter Blood directed back toward the source of energy or force that caused the spatter. Back spatter is often associated with entrance gunshot wounds.

Ball powder Smokeless powder manufactured by extruding nitrocellulose lacquer into hot water.

Ballistics Branch of physics that deals with the flights of projectiles. Ballistics is divided into four regimes: interior, transitional, exterior, and terminal.

Base line Method for measuring a crime scene and the evidence present; after a fixed line is identified, the items of evidence are measured from that line at right angles.

Base pair Combination of two nucleotides (A and T or G and C) held together by weak hydrogen bonds. The DNA double helix is formed when a base pair nucleotides in the DNA strands are connected by these bonds. The DNA strands are held together by strong chemical bonds. The two halves of the molecule are held by the weaker hydrogen bonds. The double helix may be visualized as two strips of velcro. Weak bonds hold it together and the two strips are difficult to break or rip.

Becké line A method utilized for the determination of the refractive index of materials, such as glass.

Beginning stroke Initial stroke of a letter.

Billiard ball effect Spreading of a shotgun pellet pattern caused by an intermediate target that slows the leading pellets in the shot mass. The trailing pellets overtake them and deflect them on divergent trajectories.

Biological profile A systemized study of the generic characteristics of shape and size of human remains that may allow for an estimation of age, sex, and population ancestry.

Biometrics Science and technology of using individually variable features of the human body for identification.

Bipedal locomotion Pattern of movement characterized by the use of two feet. Humans use bipedal locomotion.

Birefringent Having two or more indices of refraction. When placed between polarizing filters, birefringent materials exhibit bands of color. The specific colors exhibited when white (polychromatic) light is used as the illuminant are determined by the differences in the indices of refraction and the thickness of the birefringent material. The noun form is *birefringence*.

Bite marks The usually horseshoe-shaped pattern left in inanimate objects or the pattern injury left in the tissue of a victim.

Blood-Borne Pathogens Microorganisms originating in human blood, its components, and products derived from it, that can cause disease in humans.

Blood group A set of chemical characteristics, exhibited in the blood and sometimes other fluids which is genetically controlled and can be identified through analytical methods.

Bloodstain Transfer resulting when liquid blood comes into contact with a surface or a moist or wet surface comes into contact with dried blood.

Blot Technique for transferring DNA fragments from a gel to a different support medium such as nylon. It is based on capillary action or electrical or vacuum transfer. Also called Southern blot after its developer, E.M. Southern.

Blowback An operating principle of automatic and semiautomatic firearms. The fired cartridge blows back against the breechblock, forcing it to the rear, and extracting and ejecting the expended cartridge casing. *Blowback* also describes the blowing back of blood and other tissue onto a firearm or a shooter from a near-contact or contact shot. See *gas operation* and *recoil operation*.

Blow flies Large metallic-looking flies belonging to the family Calliphoridae in the order Diptera often attracted to a dead body immediately after death.

Blunt start Lack of one continuous movement of a writing instrument as it touches paper in the initial writing stroke.

Bolt-face signature Marking embossed on a cartridge primer (or base of cartridge) by a breechblock or bolt.

Botanical evidence Various plant structures, such as roots, stems, branches, leaves, fruits, or flowers, that may be used to determine time and season of death as well as possible prior location of remains.

Breechblock Component of breech-loading firearm that rests against the base of the cartridge.

Brentamine fast blue Chromogen used with a substrate such as alpha-naphthyl phosphate to detect acid phosphatase.

Brightness Intensity.

Broach Rifling tool consisting of a series of circular cutting tools mounted on a long rod. The rifling is cut in one pass of the broach through the gun barrel.

Bubble ring (vacuole) Ring produced when blood containing air bubbles dries and retains the bubble configuration as a dry outline.

Bullet wipe Soot, lubricant, or other material wiped from the surface of a bullet onto skin or other surfaces penetrated by the bullet.

Byte Unit of computer storage capable of holding a single character.

Cadaver dogs Dogs trained to recognize the scent or presence of decomposing remains.

Caliber Diameter of a circle tangent with the tops of the lands of the rifling. Caliber is a nominal measurement; actual bore diameter may be different from the designated caliber.

Callus (callosity) Overgrowth of woven bone surrounding area of injury.

Canids Members of the dog family.

Cannabinoids A term applied to marijuana and parts of the plant *Cannabis sativa* in which tetrahydrocannabinol (THC) is the active agent.

Carbon monoxide (CO) A highly toxic gas that is formed as a product of combustion.

Carcinogen A substance that produces cancer.

Castoff pattern Bloodstain pattern created when blood is released or thrown from a blood-bearing object in motion.

Catagen stage The intermediate or transition phase of hair growth.

Catalyst A substance which enhances the rate of a chemical reaction without actually taking part in the reaction itself. The catalyst is not changed as a result of the reaction.

Cathode A negative electrode.

Cation A positively charged ion which will migrate toward the cathode in an electric field.

Cause determination Developing an explanation of the circumstances and conditions that bring together a fuel, an ignition source, and an oxidizer to produce a fire.

Cause of death Disease or injury that initiates the lethal train of events leading to death, for example, coronary heart disease or a gunshot wound of the heart.

Cementum The outer covering of the root of the tooth.

Center fire cartridge Firearm cartridge in which the primer compound is contained in a centrally positioned primer cap.

Centromere Chromosomal region to which spindle fibers attach during cell division. It is composed of highly repetitive DNA sequences.

Certification Official recognition of professional development.

Chain of custody The documented process the evidence goes through from the point of gathering to the final presentation in court; intended to assure that there has been no tampering or altering the evidence.

Chemical color tests Chemical reactions producing colors when compounds or classes of compounds are brought into contact with various chemical reagents.

Chemical ionization A type of mass spectrometry in which a molecule reacts under relatively low energy with a reagent gas rather than fragmenting extensively.

Chemiluminescence The process by which light is emitted as a product of a chemical reaction.

Choke Constriction in the muzzle of a shotgun intended to concentrate the shot pattern.

Christmas tree stain Chemical that differentially stains sperm and other cells when mounted on microscope slides. Nuclear fast red and picroindigocarmine dyes are applied consecutively to the mount.

Chromatograms The display of separation data carried on with an instrument, usually as a chart indicating elution or retention time verses detector response for the materials separated. Qualitative and quantitative information can be obtained from a chromatogram.

Chromogen A compound which, when oxidized, displays a characteristic color.

Chromosome A long DNA molecule that also contains RNA and protein.

Circumstantial evidence Evidence requiring the trier of fact to infer certain events, for example, linking a defendant to a crime scene (and ultimately to the crime) via DNA, hair, fiber, glass, footprint, fingerprint, or ballistics evidence.

Clandestine drug laboratory Illicit location that manufactures controlled substances.

Class characteristic A feature of an item that is unique to a group of items or information in a nonindividual context about some aspect of a crime scene, e.g., a shoeprint was left by a male who wore a size 12 shoe or a hair came from a Caucasian female. Evidence that belongs to a class and is not considered unique.

Clot Gelatinous mass formed by a complex mechanism involving red blood cells, fibrinogen, platelets, and other clotting factors. Over time, the clot retracts, resulting in a clear separation of the mass from the more fluid, yellowish serum remaining at the periphery of the stain (see *serum stain*).

- Cocaine** A controlled substance derived from the erythroxylin cocoa plant that creates an excitatory condition (stimulation), state of wakefulness, and euphoria.
- CODIS** Combined DNA index system. A DNA database system.
- Codominance** A state where both forms of paired alleles at the same locus are expressed.
- Coleoptera** Major order of insects (beetles) important in forensic entomology and taphonomy.
- Commissure** Corner of the mouth.
- Common origin** The establishment by measurements or analyses that significant differences between two items cannot be shown; the conclusion is that they share the same source.
- Comparison microscope** Two microscopes linked by an optical bridge so that the observer can simultaneously view two independent images in one field each from a separate objective.
- Comparison sample** An uncontaminated or unmodified example to be used for comparison with a sample that may have been modified, altered, damaged, or contaminated.
- Compound binocular microscope** A microscope employing two eyepieces that magnify an image formed by a single common objective for high magnification in the range of 25 to 1200X.
- Computer crime** A criminal act where the computer is the victim, such as the introduction of a virus.
- Computer-related crime** A criminal act where the computer is involved, such as fraud.
- Concentric cracks** Those fractures that appear to circle around the point of impact.
- Conchoidal lines** Edge characteristics of glass fractures. They are stress marks shaped like arches that are perpendicular to one glass surface and curved nearly parallel to the opposite surface. The perpendicular surface faces the side where the crack originated.
- Conditional evidence** Evidence created by an action or event at a crime scene.
- Congenital anomaly** An abnormality, such as a spinal column defect, present at birth.
- Connecting stroke** Joining the ending stroke of one letter to the beginning stroke of another letter.
- Contact wound** A skin injury produced by a weapon in contact with or a fraction of an inch from the skin when discharged.
- Contraband** In forensic toxicology and drug testing facilities, this refers to suspected controlled substances.
- Contrast** Tonal ranges within an image.
- Control** A test performed in parallel with an experimental procedure and designed to yield predictable results that confirm the reliability of the experimental results.
- Controlled substance** Any substance, usually a drug, whose possession or use is regulated by law.
- Contusion** Bruise; leakage of blood from damaged blood vessels into tissues.
- Contusion ring** Bruising at the edges of a gunshot wound caused by penetration of the skin by a bullet.
- Copybook** Instruction manual for learning penmanship.
- Coroner** A court official in medieval England whose duties included investigating sudden and unexpected deaths and deaths from injury; in the United States, an elected official with death investigation duties.
- Cortex** The main body of hair containing protein fibrils, pigment, cortical fusi, and ovoid bodies.
- Cortical bone (cortex)** External layer of bone, characteristically dense and having a relatively smooth surface, as contrasted with inner, spongy bone.
- Cortical fusi** Microscopic air pockets or vacuoles within the cortex of hair.
- Creatinine** Component of urine that reacts with picric acid to form creatinine picrate, a detectable color product.
- Crime scene** Location of a crime, such as the room where a rape-homicide occurred or intersection where a truck was highjacked. The crime scene contains physical evidence used by forensic scientists to generate class or individual linking statements that constitute material evidence. Multiple crime scenes are possible, for example, a murder site and a subsequent burial site.
- Crime scene assessment** The process of analyzing cases to determine the "profile" of an unknown offender.
- Crime scene documentation** Permanent recording of the crime scene conditions and physical evidence present.
- Crime scene management** Teamwork approach of investigators and crime scene personnel that successfully resolves a case.

Crime scene reconstruction Analysis and reconstruction of a crime scene that logically links a detailed series of scientific *explanations* to provide an understanding of the sequence of events. Each explanation is developed, linked, and evaluated by applying *scientific method* to available data. This process involves proposing, testing, and evaluating explanatory connections among the physical evidence related to the events. The purpose of the analysis is to find the *best explanation* of related events.

Criminal investigative analysis Use of investigative techniques including indirect personality assessment, equivocal death analysis, investigative suggestion, trial strategy, characteristics and traits (profile) of unidentified.

Criminalistics Application of physical sciences to criminal investigation.

Cut or cut wound Incised wound that penetrates less than the maximal surface dimension.

Cut rifling Rifling created by hook cutting, scrape cutting, or broaching.

Cuticle The outermost layer of hair formed by overlapping scales.

Cyanide (CN) A highly toxic chemical especially in the form of gas (hydrogen cyanide).

Cyanoacrylate Important fuming method for the visualization of latent fingerprints; also called Super Glue fuming.

Cyber forensics The extraction of evidence that particular digital data passed over some medium between two points in a network.

Cytosine (C) One of the four nucleotide bases in DNA. The others are adenine, guanine, and thymine.

Daubert test A standard for determining the reliability of scientific expert testimony in court currently adopted by many jurisdictions. Five factors are utilized to assess the scientific theory or technique: testing of theory, use of standards and controls, peer review, error rate, and acceptability in the relevant scientific community.

Dedicated dimensional standard The labeled ruler that is used in all analyses and photographs for a given bite mark case.

Deductive reasoning Using nonspecific details to infer a specific fact.

Defendant The suspect or accused in a criminal case or the person who is alleged to have caused the injury to the plaintiff.

Denaturation Loss of the natural configuration of a molecule through heat, chemical treatment, or pH change.

Dental stone Gypsum product, similar to plaster of Paris. Its hardness and durability make it a superior product for casting footwear or tire impressions.

Dentin The inner calcified skeleton of the tooth.

Dentine (dentin) Main substance of a tooth, consisting of a layer of tissue surrounding the pulp. The dentine is surrounded by the enamel of the tooth crown and the cementum of the tooth root.

Dentition The complement of teeth of an individual.

Deoxyribonucleic acid (DNA) Double-stranded helix molecule carrying genetic information; composed of four deoxyribonucleotides: adenine (A), thymine (T), cytosine (C), and guanine (G).

Depressant Drug that reduces excitability and calms a person.

Design element Raised rubber design on a tire; design elements arranged around a tire form the overall design.

Destructive testing Testing that alters an original document, for example, barely noticeable hypodermic needle holes in an ink line (for TLC) or partial destruction of a small portion for paper testing.

Diaphysis Shaft of a developing long bone prior to union with the ends (epiphyses). The adjective form is *diaphyseal*.

Digital A computer device that processes data in digital form.

Digital evidence Contents of data packets traveling on a network.

Diluent Inert substance used to increase the mass of a controlled substance; exerts no physiological effect; is used to give the illusion that more controlled substance is present than actually is present.

Dinucleotide repeat Most common microsatellite repeat; two nucleotides are repeated in tandem.

Dipteria Order of insects that contains the true flies such as blowflies, houseflies, horseflies, crane flies, mosquitos, and midges.

Direct evidence Information that establishes a fact directly, without the need for further inference, for example, an eyewitness' testimony that the defendant fired the fatal shot.

Directionality Parameter that indicates the direction the blood was traveling when it impacted the target surface. Directionality of flight can usually be established from the geometric shape of the bloodstain.

- Directionality angle** Angle between the long axis of a bloodstain and a predetermined line on the plane of the target surface that represents zero degrees.
- Direction of travel** Trajectory or flight directionality of a blood drop that can be established by its angle of impact and directionality.
- Disarticulated joint** A joint that is no longer held together by soft tissue.
- Discovery motion** A formal legal request designed to allow the defense access to evidence in the possession of the prosecutor prior to trial.
- Discriminant function** Statistical method by which one subpopulation is quantitatively separated from another on the basis of specific numerical characteristics.
- Disguised writing** Alteration of handwriting for the purpose of concealment.
- Disorganized criminal** Commits crime impulsively with little or no planning. The perpetrator's lack of control over his victim and himself is apparent.
- Distal** Farthest from the center or point of attachment. In hair morphology, the tip is distal from the root.
- Distant wound** Firearm wound that lacks stippling, smoke, or soot. It generally indicates a distance of 1 meter or more from the skin to the gun muzzle at the time of discharge.
- DMORTs** Disaster Mortuary Operational Response Teams that process mass fatalities for the Federal Emergency Management Agency (FEMA).
- DNA Advisory Board (DAB)** A national board that provides guidelines and standards for DNA testing laboratories.
- DNA band** Visual image on an autoradiogram or agar gel showing a restriction fragment length polymorphism allele or DNA fragment.
- DNA fingerprinting** Series of techniques using the base sequence of an individual's DNA for identification purposes.
- DNA fingerprint** Multilocus genotype or phenotype that is sufficiently rare to be considered unique.
- DNA probe** Short segment of DNA marked with radioactive or chemical components and used to detect complementary fragments of DNA.
- DNA polymerase** Enzyme capable of linking deoxyribonucleotide subunits to make a DNA molecule. The original single-stranded DNA is called a template.
- DNA polymorphism** Two or more different DNA sequences at a particular gene locus or site in a population. ABO blood groups and hair and eye colors are polymorphisms. DNA polymorphisms and blood groups require special techniques to identify differences. Hair and eye colors are easier to identify.
- DNA sequence** Order of deoxyribonucleotide subunits (A, T, G, and C) in a DNA molecule, e.g., ATAAGGC ...
- dNTP** Specific nucleotide used in the polymerase chain reaction process.
- Document** A written item employing marks and symbols to convey a message.
- Dominant trait** A trait that is expressed even if present only in one of the two alleles. If a gene has only one dominant allele (in which case, the one donated by the other parent is recessive), the physical manifestation of the trait will reflect the dominant allele.
- Dot** The smallest component of printer output. Resolution is expressed in dots per inch or pixels per inch.
- DOT number** A number that appears on every tire. It shows where and when the tire was made. The U.S. Department of Transportation has required such numbers since 1972.
- Double helix** Structure of the DNA molecule consisting of linked nucleotide subunits forming long strands joined by complementary bases.
- Dpi (dots per inch)** Measure of resolution of printer output. The more dots per inch, the higher the resolution. A 600 dpi resolution has 600 horizontal dots and 600 vertical dots per inch or 360,000 (600 × 600) dots.
- Drawback effect** Blood in the barrel of a firearm that has been drawn backward into the muzzle.
- Drip pattern** Bloodstain pattern resulting from blood dripping into blood.
- Drop down** The material dropped or the spreading fire by dropping burning materials onto unburned combustible materials and igniting them.
- Drug** Nonfood substance intended to affect the structure or function of the body.
- DRUGFIRE** A database used for acquiring, storing, and analyzing images of bullets and cartridge casings.
- Druggist's fold** Primary or inner container used to hold evidence.
- Dry origin impression** Impression that contains no significant moisture from itself or its substrate when made.

Dual tire assembly Wheel assembly with two tires mounted next to one another on each side of an axle.

Duquenois-Levine test Chemical color test used to confirm the presence of cannabinoids in plant material.

Dynamic loads Loads or forces that change and usually produce motion.

Ejector projection Device in an automatic or semiautomatic firearm that wrests the expended cartridge from the extractor and ejects it from the firearm; in a revolver, it ejects cartridges from the chambers in the cylinder.

Electrochemical etching Rifling method in which the grooves of the rifling are produced by an electrochemical process.

Electrophoresis A technique for the separation of charged molecules by migration on a support medium under the influence of an electric potential.

Electrostatic charge Charge of negative ions, similar to the static charge emitted by newly dried socks.

Electrostatic lifting Using a high voltage device to electrostatically transfer a dry-origin dust or residue impression to a black film, thus improving the contrast.

Embossing A raised design or relief design usually found in custom printing.

Enamel The outer covering of the crown of the tooth.

Encrypted evidence Hidden data on a disk that is accessible with the use of a password or key.

Ending stroke Terminal stroke of a letter.

Enhancement Rendering an impression more visible through physical, photographic, chemical, or digital methods.

Enhancer sequence Eukaryotic DNA sequence that increases the level of transcription; may be upstream or downstream from the promoter.

Entomology The scientific study of insects.

Epiphyseal union Joining of one bone growth center or epiphysis at either end of a long bone to another, commonly the diaphysis or shaft of a long bone.

Epiphysis Bone growth centers at the ends of long bones, on the margins of some flat bones, and as projecting areas (processes or tubercles) connected to the main parts of bones by cartilage, and eventually fusing to them. The adjective form is *epiphyseal*.

Equifinality In taphonomy, different agents may produce modifications to bone that cannot be differentiated from one another.

Equivocal death Manner of death (homicide, suicide, accident) remains undetermined after a complete investigation.

ESDA Electrostatic detection apparatus; instrument that recovers indented writing.

Ethanol Ethyl alcohol or beverage alcohol found in beer, wine, and liquors.

Eukaryotic A biological superkingdom containing organisms whose cells have true nuclei. Cell division occurs by mitosis and meiosis. Other kingdoms within this superkingdom are Fungi, Animalia (including humans), and Plantae.

Evidence Information gathered by the prosecution and defense that satisfies the requirements of state or federal rules of evidence.

Examination quality photographs Photographs taken by a camera held directly over evidence, such as a shoe or tire impression, that will be useful during a detailed examination of that evidence.

Exemplar Example or representative item usually in undamaged or less damaged condition to which a damaged item can be compared.

Exon DNA base sequence that encodes amino acid sequences for protein.

Expert witness The specialist who is recognized for his/her expertise and is asked by the trier of fact to evaluate the facts in a case and render an opinion.

Expirated or exhaled blood Blood propelled from the nose, mouth, or a wound as a result of air pressure and/or air flow.

Explosion Sudden conversion of potential energy (often chemical) to kinetic energy accompanied by physical destruction of the container or structure via a high pressure wave front.

Exsanguination Death after a significant amount (usually half or more) of blood is lost. Bleeding to death.

Extraction Separation of the compound of interest from the rest of the sample.

Extractor Component of a firearm that pulls an expended cartridge from the firing chamber.

Extruded powder Smokeless powder manufactured by extrusion of nitrocellulose dough through a perforated steel plate. A sharp knife rotating against the plate cuts specified lengths of extruded dough.

False allegation An unfounded claim of sexual assault or receipt of threatening or obscene notes or telephone calls.

- Fatigue, material** A material becomes "tired" due to repeated applications of dynamic loads. The material fractures or fails at a strength level significantly less than it would fracture or fail if only static loads were applied.
- Fibers** A common class of microscopic evidence. They are classified as animal, vegetable, or mineral, or natural, manufactured, or synthetic.
- Filler** Material added to paper during manufacture.
- Firearm** Heat engine that converts the chemical energy of a propellant into kinetic energy of a projectile.
- Fire load** Amount of material that can burn. The average fire load of a building is usually stated in British thermal units (BTUs) per square foot to enable the comparison of the propensity of one building to that of another.
- Fire patterns** Marks left by fire, smoke, and soot on structures and devices. Several characteristic patterns help identify the relationship and orientation of the fire to the structure: horizontal patterns, plumes, V-shaped patterns, and saddle burns.
- First instar** First-stage fly larvae that cannot penetrate skin and must subsist on liquid protein.
- First responder** First person arriving at a crime scene; usually a law enforcement officer or other emergency personnel.
- Fish system** An image database for handwriting comparison developed in Germany.
- Flanking region** Region just adjacent to a region of interest, a gene, a repeat, or any other sequence.
- Flight path** Path of the blood drop as it moves through space from the impact site to the target.
- Flintlock** A weapon in which ignition of the propellant is accomplished by a piece of flint striking sparks from a piece of steel called the frizzen. The sparks fall into a pan containing fine black powder.
- Flow pattern** Change in the shape and direction of a wet bloodstain due to the influence of gravity or movement.
- Fluorescence** The property of producing light when acted upon by radiant energy.
- Font** A complete set of type in one size and face.
- Footwear** Apparel worn on the foot, such as tennis shoes, boots, sandals, etc.
- Footwear database** Computerized compilation of shoe sole designs for the purpose of associating a crime scene impression with a manufacturer or to link crime scene impressions from one scene to others.
- Forcing cone** Flaring at the breech end of the barrel of a revolver. It serves to guide the bullet into the rifling.
- Forensic anthropology** Application of anthropology theory and methods, primarily human skeletal biology, taphonomy, and archaeological methods, to solve medicolegal problems.
- Forensic archaeology** Application of archaeological methods to recover human remains and interpret their spatial associations.
- Forensic entomology** The application of entomology to legal cases and insects associated with a dead body.
- Forensic evidence** Information generated by the prosecution or defense that satisfies the requirements of state or federal rules of evidence.
- Forensic nursing** The application of forensic science combined with the biological and psychological education of the registered nurse in the scientific investigation, evidence collection and preservation, analysis, prevention and treatment of trauma and death-related medical issues.
- Forensic odontology or forensic dentistry** Forensic dentistry; the application of the arts and sciences of dentistry to the legal system.
- Forensic pathology** The specialty of medicine and subspecialty of pathology dealing with investigating the causes of sudden and unexpected deaths.
- Forensic psychology** Application of psychological findings to the law, legal systems, and legal processes.
- Forensic taphonomy** Study of postmortem processes and their relationships to environmental contexts.
- Forensic toxicology** The examination of all aspects of toxicology (the study of drugs and poisons that may have legal implications).
- Forward spatter** Blood that travels in the same direction as the source of energy or force; often associated with exit gunshot wounds.
- Foundation** A required showing to the trial court prior to the admissibility of certain evidence, such as bullet matching, that the party offering it has sufficient knowledge to be able to truthfully testify. One example is a ballistics examiner's rendition of reliable credentials.

Fragile X syndrome A complex inherited syndrome of mental retardation usually seen in males and associated with a tendency for the X chromosome to break in culture at a trinucleotide repeat site.

Fragmented disk Occurs when there are insufficient contiguous clusters to hold a large file so that it is broken up and spread around the disk taking advantage of available clusters.

Freehand simulation Attempt to copy or draw a signature without the use of mechanical aids.

Friction ridge skin Skin on the soles of the feet, palms of the hands, and fingers in humans and some primates that forms ridges and valleys. Friction ridge skin forms classifiable patterns on the end joints of the fingers.

Frye standard A standard applied in some jurisdictions to the admissibility of scientific theory and method in court based upon the acceptance of the theory and method by the scientific community.

Gait measurement Measurement of stride.

Gamete Cell produced in the gonads of a male or female that contains half the DNA and half as many chromosomes as normal body or somatic cells. Sperm cells are produced by the testes and eggs are produced by the ovaries.

Ganser's syndrome A syndrome often observed in prisoners. Individuals routinely give inaccurate answers to simple questions. Some experts regard this behavior as a form of malingering; others believe that it reflects a distinct syndrome that has existed more than 100 years.

Gas chromatography Gas flowing through a coated tube separates compounds by their size, weight, and chemical reactivity with the coating of the tube or column.

Gas operation An operating principle of automatic and semiautomatic firearms. A small amount of propellant gas is vented into a piston that pushes a rod to the rear, opening the breech, and extracting the expended cartridge. See *blowback* and *recoil operation*.

Gauge Method of designating the diameter of a shotgun barrel. It equals the number of round lead balls of the diameter of the interior of the shotgun barrel required to weigh 1 pound.

GC-MS Acronym for gas chromatography coupled with mass spectrometry.

Gel Support medium, made from resin (acrylamide) or polysaccharide (agarose) that holds DNA molecules in place during the separation phase of electrophoresis.

Gene DNA passed on to descendants. It functions by specifying the compositions of proteins. The gene is an ordered sequence of nucleotide base pairs that has a describable characteristic such as function (hemoglobin), size (15.2 kilobase pairs), or location (gene on the short arm of the seventh chromosome).

Gene frequency Relative number or percentage of a specific allele, band, or DNA fragment in a population.

Genetic linkage Quality that causes some traits to be inherited together, indicating that the traits are located close to each other on the same chromosome.

Genome The totality of an individual's DNA or genetic material; it is contained in every cell.

Genomic DNA DNA contained in a complete set of DNA molecules or chromosomes; the amount inherited from one parent in a sperm or an egg.

Genotype The configuration of genes at a specific locus.

Gigabyte 1,073,741,824 bytes.

Glycogen Storage form of starch in animal cells. It is produced by vaginal epithelia and is the basis for a presumptive test for these cells.

Glycoprotein A macromolecule composed of protein and carbohydrate.

Grabbers Mechanical "fingers" in a copy machine or printer that draw the paper through the machine.

Graphology Study of handwriting and how it relates to personality.

Gravimetric quantitation Using the ratio of preextraction and postextraction weights to determine concentration.

Gray ring See bullet wipe.

Green tire Unfinished tire that has all its components but has not yet been molded. It has no tread or sidewall design.

Grooves Void areas that run around and across a tire between the design elements. Recessed areas of rifling.

Guanine (G) One of the four nucleotide bases in DNA. The others are adenine, cytosine, and thymine.

Habit Repeated handwriting characteristic.

Hacker One who willfully penetrates or attempts to penetrate a computer system without authorization.

Hacking Unauthorized access or attempts to access computer assets.

Hallucinogen Psychoactive drug that induces hallucinations or alters sensory experiences.

- Hammer forging** Rifling method in which a barrel blank is hammered down over a mandrel. This method is used to make polygonal rifling.
- Handgun** Firearm designed to be fired with one hand.
- Haploid cell** Cell containing only one set of chromosomes, usually gametic cells.
- Haploidy** The ability of the human egg and sperm to carry only half the amount of DNA found in body cells.
- Haplotype** Set of closely linked genetic markers on one chromosome that tend to be inherited together.
- Hardy-Weinberg equilibrium** In a randomly breeding population, the number of individuals exhibiting a recessive trait is half the number of individuals who do not express the trait and carry only one of the recessive alleles. The assumptions used to derive this equilibrium are (1) no mutation or migration, (2) random mating, (3) no selection, and (4) infinite population size. The assumptions do not need to be met to use the Hardy-Weinberg to estimate genotype frequencies from allele frequencies.
- Hashish** The resin from marijuana that has been isolated from the plant material.
- Hematoma** A tumor of blood caused by leakage from damaged blood vessels; it contains enough blood to form a blood-filled space.
- Heme** The non-protein portion of hemoglobin and a number of proteins in the body. Possess an iron protoporphyrin structure.
- Hemoglobin gene** Human hemoglobin is a tetramer composed of two alpha chains and two beta chains in adults. Other genes and pseudogenes are transcribed during fetal development. The alpha cluster is on chromosome 16 and the beta cluster is on chromosome 11.
- Height ratio** Distance from the base of a letter to the top relative to another letter.
- Henry system** Classification of 10-fingerprint cards so that they could be stored in large files. The system has been rendered largely obsolete by AFIS, but was widely used in the United States and the United Kingdom.
- Heteroplasmy** Genetic heterogeneity within populations of mitochondria in an individual.
- Heterozygosity** Two alleles at one locus.
- High risk crime** Crime committed at time or place that posed a great threat of discovery to the offender. This category of crime is normally attributed to the "disorganized" criminal. The use of alcohol or drugs will greatly enhance the risk potential of the offender by lowering inhibitions.
- High risk victim** Person who, because of occupation, sexual history, life style, or other circumstances, is highly vulnerable to violent crime.
- High velocity impact spatter** Bloodstain pattern caused by a high velocity force or impact of approximately 100 feet or more per second, such as the force produced by a gunshot or high speed machinery. Blood does not spatter at the same velocity as the wounding agent. The pattern is characterized by a mist-like dispersion that, due to the great surface areas of small droplets, can travel only a short horizontal distance. Most individual spots produced by these mist-like droplets are usually 0.1 millimeter or smaller in diameter although larger spots are always produced.
- HITS** Homicide investigation and tracking system. A database at the Washington State Attorney's Office for murder and sexual assault information.
- Homology** Biological structures having common or shared ancestries.
- Homozygote** Individual whose genetic makeup (genotype) is composed of identical alleles or bands at a particular gene (e.g., AA or aa).
- Hook cutter** Rifling tool with a raised cutting edge used to cut one groove of rifling at a time.
- Hybridization** DNA molecules are composed of two complementary halves that serve as templates for each other. Hybridization occurs when these halves separate and a half of different origin connects with one of the separated halves to form a hybrid molecule.
- Hypervariable** Some segments of DNA molecules are identical or almost identical in all individuals while others show variability. A hypervariable is a DNA segment that is highly variable and differs in most individuals.
- Hypervariable region** Locus with many alleles, especially those whose variation is due to variable numbers of tandem repeats.
- IAI** International Association for Identification, the main professional organization for latent print examiners.
- IBIS** Integrated ballistics information system. A database used for acquiring, storing, and analyzing images of bullets and cartridge casings.
- ICP-MS** Inductively coupled plasma-mass spectroscopy. A modern technique for metal analysis that utilizes radio frequency energy for the detection and quantitation of metals.
- Identification evidence** Evidence that provides positive identification of the source.

Ignition source Location of a flame, arc, spark, or chemical reaction that provides sufficient heat energy in the presence of a fuel and an oxidizer to initiate combustion.

Ilium Upper blade-like portion of the adult pelvis. The adjective form is *iliac*.

Image resolution Number of pixels displayed per unit of printed length in an image, usually measured in pixels per inch (ppi).

Immunoassays Tests utilizing antibodies that react with a drug or substance that recognizes the antibody.

Immunoglobulin gene Immunoglobulin is a collective term for all the antibodies produced by an organism. Immunoglobulins are produced by complex heavy and light chain genes that undergo rearrangement during B cell development to produce an enormous variety of antibodies.

Impact site Point on a bloody object or body that receives a blow. *Impact site* is used interchangeably with *point of origin*. An impact site may be an area on the surface of a target that is struck by blood in motion.

Impact spatter Bloodstain pattern created when blood receives a blow or force resulting in the random dispersion of smaller drops.

Incendiary fire Fire intentionally caused by human activity.

Incised wound Injury produced by a sharp instrument and characterized by lack of surface abrasion and absence of bridging vessels, nerves, and smooth margins.

INDELS Single-base insertion or deletion, also called SNP (single nucleotide polymorphism); can be more than one base, e.g., a two-base pair insertion or deletion.

Indented writing Writing impressed into the surface of a page of paper from pressure exerted upon the writing instrument when used on a previous page.

Independent testing The repeating of a scientific test by a defense expert or independent laboratory performed to ensure confidence in the result rendered by the prosecution expert.

Indirect personality assessment Assessment of a known individual believed to be responsible for the commission of a violent crime. This technique is utilized in preparing for cross-examination during trial, during interviews and interrogations, in investigating equivocal deaths, and in other situations.

Individual characteristic Feature that is unique to a specific item. Information in a specific context about some aspect of a crime scene, e.g., a print was left by a shoe consistent in all respects to the defendant's shoe, a hair was consistent in all respects to a sample of hair from a Caucasian female, or handwriting features are attributable to a particular person.

Individualization Establishment of uniqueness of an item through examination and experimentation; showing that no other item is exactly like the one in question. The adjective form is *individualistic*.

Inference Conclusion or deduction of a fact from examination of other case facts, e.g., the DNA found at the crime scene allows us to infer that the defendant was at the crime scene.

Infrared Type of light energy greater than that of visible light but shorter than microwave energy.

Infrared reflectance Tendency of an ink specimen to lighten when exposed to infrared light.

Infrared spectroscopy Use of the absorption of infrared radiation to produce a chemical fingerprint of a substance.

Inkjet printer Type of printer that sprays ionized ink onto a sheet of paper.

Insurance fraud Act intended to deliberately deceive an insurance carrier into paying a claim for a loss or issuing a policy based on false evidence. This may include a claim for the loss of a structure due to an intentionally set fire or a claim for reimbursement for items of greater value than those present in a fire-damaged structure.

Intermediate range gunshot wound Firearm wound that shows stippling but no smoke; generally indicates a distance of a few millimeters to a meter from skin to gun muzzle at the time of discharge.

Intrusion management A functional or operational model for describing the information protection process.

Iodine fuming Nondestructive method of visualizing latent fingerprints based on the interaction of iodine vapors with lipids in the latent residue; usually used to develop fingerprints on items with high intrinsic value.

Ion pairing A method of separation or isolation of a compound based on the affinity of the hydrochloride for chlorinated solvents, such as chloroform, over an acidic environment with a high chloride content, such as HCl.

- Isoelectric Focusing (IEF)** A process of separating molecular species where the molecules accumulate or focus at their respective isoelectric points.
- Isoelectric Point (IEP)** The pH at which a normally charged molecule has no net charge.
- Isotope** Chemical element that exists in alternate forms containing identical numbers of protons and different numbers of neutrons.
- Isozyme** Multiple molecular forms of an enzyme occurring in a single species.
- Junk DNA** The discovery that much of the DNA in every cell was repeated sequence DNA that cannot code for polypeptides and led to speculation that the repeat sequence DNA had no function.
- Karyotype** In humans, the 46 chromosomes (23 pairs of homologous chromosomes) constituting our complete chromosomal inheritance. They are usually made microscopically visible by staining at the stage of cell division known as metaphase.
- Kilobyte** 1024 bytes.
- Laceration** Injury produced by blunt instruments; characterized by surface abrasion, bridging vessels and nerves with irregular margins.
- Land** Raised area of rifling.
- Laser** Source of high intensity monochromatic (single wavelength) light. Certain methods use lasers to develop latent fingerprints.
- Laser printer** Type of printer that uses a laser beam to produce an image on a drum.
- Latent print** Fingerprint that cannot be seen under normal ambient lighting. A latent print requires some type of enhancement to clarify ridge details sufficiently to allow comparison and identification.
- LCMS** Liquid chromatography-mass spectrometry is a technique that replaces a gas chromatograph with a liquid chromatograph.
- LD50** The quantity of a substance that kills 50 percent of the population.
- Lens** An optical component that may be composed of one or multiple elements.
- Levels I, II, and III** Ashbaugh's terminology for fingerprints. General patterns, such as whorl, ulnar loop, etc., constitute Level I. Minutiae in the ridges constitute Level II. Sizes, shapes, and orientations of pores and edges constitute Level III.
- Light spectrum** Distribution of light energy viewed as a range of different colors, e.g., a rainbow.
- Lightning** Large-scale, high tension natural electric discharge in the atmosphere.
- LIMS** Laboratory information management systems. A system of databases for maintaining evidence control.
- Line quality** Appearance of a written stroke determined by a combination of factors, such as speed, shading, pen position, and skill; ranges from smooth and legible to tremulous and awkward.
- Lingual** Tongue-side.
- Linkage equilibrium** Mathematical expectation that the frequencies of alleles at one gene are independent and can predict the frequencies of a double event. Analogies with gender and race or suits of playing cards may explain this concept. If males represent 50% of a population and Irish males represent 12.5%, one can estimate the percentage of the population consisting of Irish males by multiplying 50% by 12.5%. If the result is not an accurate prediction, the population is in linkage disequilibrium.
- Liquid accelerant** Combustible or flammable liquid used to accelerate ignition and spread of a fire.
- Living forensics** The identification and collection of evidence derived from living patients.
- Livor mortis** The postmortem reddish discoloration of the body due to the settling of red blood cells due to gravity.
- Locard's exchange principle** According to Edmond Locard, when two objects contact each other, materials are transferred from one object to another; the basis for proving contact by the analysis of microscopic evidence.
- Locus** Chromosomal position where a particular gene is found. The plural is *loci*.
- Low risk victim** Person whose victimology (sexual habits, lifestyle, pastimes, etc.) does not suggest that he or she may become the victim of a violent attack. If an attack occurs, one can hypothesize that the offender specifically targeted the victim, took advantage of his or her vulnerability, or knew the victim.
- Low velocity impact spatter** Bloodstains produced when the source is subjected to low velocity force (5 feet per second or less).
- LPI** Lines per inch.
- Lysis, cell** Disruption of a cell membrane that releases the cell contents including the DNA. The verb form is *lyse*.
- Machine gun** Bipod- or tripod-mounted automatic weapon whose ammunition is fed from a magazine or a belt.

Machine pistol Type of submachine gun.

Macroscopic Visible without magnification.

Macroscopic crime scene Description based on the size of a crime scene; the overall or "big picture" crime scene.

Macroscopic examination Visual examination, generally performed with the unaided eye; used to identify class characteristics.

Maggot Fly larva prior to the maturation of the adult fly.

Malingering Conscious attempt to feign a physical or mental illness; also called *simulation*.

Mandible Lower jaw.

Mandibular condyle Small, rounded projection of the lower jaw that forms a moveable joint with the cranium.

Manner of death Death occurs in one of four manners: natural, if caused solely by disease; accidental, if it occurs without apparent intent; suicidal, if caused by the deceased; and homicidal, if someone other than the deceased caused it.

Marginal abrasion See contusion ring.

Marijuana The common name for the plant *Cannabis sativa*.

Mass spectrometry Technique based on the detection of vaporized molecules and their ionized (charged) fragments. The detection and display of the spectra are based on the mass-to-charge ratios of the ions. The method is specific for qualitative analysis and useful for quantitative analysis.

Mastoid process Cone-shaped projection of the temporal bone located behind and below the opening for the ear.

Maternal lineage Genetic component passed through the female lines of a family, e.g., mitochondrial DNA.

Maxilla Upper jaw.

Mechanism of death Biochemical and/or physiologic abnormality produced by the cause of death which is incompatible with life, e.g., ventricular fibrillation or exsanguination.

Medical examiner Government official, always a physician and often a forensic pathologist, charged with investigating sudden and unexpected deaths or deaths from injuries.

Medium velocity impact spatter Bloodstains produced when a blood source has been subjected to a medium velocity force (5 to 25 feet per second). A beating typically causes this type of spatter. Most spots of blood produced in this manner are usually 1 to 3 millimeters in diameter, but larger and smaller spots also occur.

Medulla The lengthwise central canal of a hair shaft.

Megabyte 1,048,576 bytes.

Megahertz (MHz) One million cycles per second.

Megapixel One million pixels.

Melanin The pigment that imparts color to hair and skin.

Metameric Two or more materials that appear the same color under one type of illumination and different under another. Spectral analyses can differentiate metameric pairs.

Metaphysis Wide areas at both ends of an immature long bone shaft or diaphysis; contain growth zones and are attached and eventually united to epiphyseal discs. The adjective form is *metaphyseal*.

Microanalysis Application of a microscope and microscopical techniques to the observation, collection, and analysis of microevidence.

Microcrystal tests A reaction between the compound of interest and chemical reagent that results in the formation of unique crystals that can be observed with the microscope.

Micrometry A device utilizing a scale calibrated with stage micrometer for measurement of the physical dimensions of material viewed with a microscope.

Microorganisms Germs, including bacteria, yeasts, and viruses.

Microsatellite Short tandem repeat or simple sequence length polymorphism composed of di-, tri-, tetra-, or pentanucleotide repeats.

Microscopic crime scene Crime scene description based on the type of physical evidence present.

Microscopic examination Visual examination utilizing some type of magnification; used to identify individual characteristics.

Microspectrophotometry Instruments that generate transmission, reflection, or absorption spectra from various translucent and opaque samples. The principal types are visible and infrared.

Minisatellite Simple sequence tandem repeat polymorphism in which the core repeat unit is usually 10 to 50 nucleotides long; variable number of tandem repeats.

Minutiae Ending ridges, bifurcations, and dots in the ridge patterns of fingerprints; the quality and quantity of these features serve as the bases of comparison and latent print identification.

Misting Blood reduced to a fine spray as the result of the application of energy or force.

- Modus operandi (MO)** Method of operation of a criminal. The principle that a criminal is likely to use the same technique repeatedly and that any analysis and record of the technique used in every serious crime will provide a means of identification in a particular crime.
- Monitor resolution** Number of pixels or dots displayed per unit of length on the monitor, usually measured in dots per inch (dpi). Monitor resolution depends on the size of the monitor and its pixel setting. Most new monitors have resolution of about 96 dpi.
- Morphology** Scientific study of the forms and functions of living organisms; shape and size of an organism in relationship to its function. The adjective form is *morphological*.
- MSDS** Descriptive information about a particular chemical, providing information about its physical and chemical characteristics and how it should be handled and stored.
- mtDNA** Mitochondrial DNA; the DNA found in mitochondria; a circular duplex with a genetic code differing from the universal genetic code.
- Multilevel approach to crime scene security** Assigning various levels of restrictions to areas within and around a crime scene.
- Multiplexers** Surveillance cameras recorded on a videotape often combined with an alarm system.
- Mutation rate** Number of mutation events per gene per unit of time (for example, per cell generation); the proportion of mutations per cell division in bacteria and single-celled organisms or the proportion of mutations per gamete in higher organisms.
- Myotomy** The cutting of muscle; in the forensic odontology chapter, used to describe a technique of cutting certain facial muscles to release post-mortem rigor mortis.
- Myotonic dystrophy** Common form of muscular dystrophy affecting adults. Its gene has a trinucleotide repeat.
- NAA** Neutron activation analysis. A technique for metal analysis utilizing the characteristics of emitted radiation for the detection and quantitation of metals.
- Nanotechnology** Technology involving devices of only a few nanometers in size.
- Narcoanalysis** Interview conducted while a subject is under the influence of an intravenously injected substance such as sodium amytal.
- Narcotic** Addictive substance that reduces pain, alters mood and behavior, and usually induces sleep or stupor.
- Natural cause** Event, such as lightning, flood, tornado, earthquake, etc., that is not under the control of humans.
- Negligence** The failure to treat the patient at the highest level of care and competency.
- Nessler's reagent** Solution of mercuric iodide in potassium iodide; used to detect ammonia when urea is catalyzed to ammonia and carbon dioxide by urease; used forensically to detect urine.
- Neutral population genetic theory** Hypothesis that most genetic variation in natural populations is not maintained by selection because most alleles have equal fitness.
- NIDA** The National Institute on Drug Abuse.
- Ninhydrin** Common name for triketohydrindene, a chemical that reacts with amino acids to form a recognizable bluish-purple compound called Ruhemann's purple; widely used to visualize latent fingerprints, often requires posttreatment.
- NIST** National Institute of Standards and Technology. Federal agency responsible for setting, approving, and maintaining measurements and materials standards in the United States (formerly National Bureau of Standards).
- Noise treatment** Arrangement of design elements of various sizes around the circumference of a tire to reduce noise.
- Noncoding region** Segment of DNA that does not have a nucleotide sequence that can be transcribed because stop codons are present or the sequence does not make sense.
- Noninvasive analysis** Analysis, testing, or examination that does not produce permanent and irreversible alteration of the evidence.
- Normal hand forgery** Writing another person's signature without attempting to simulate or disguise; written in one's own handwriting.
- Nonrequest standard** Normal writing, done without attention to the writing process.
- Nuclear fast red** Biological stain used to differentially stain spermatozoa to aid in their identification. It stains their nuclear material a dark red.
- Nucleotide** Molecule consisting of a base, a pentose sugar, and a phosphoric acid group.
- Nucleus** Cellular organelle surrounded by a nuclear envelope; it encloses the chromosomes during the interphase.
- Oblique lighting** Lighting cast across a page of writing at an angle almost parallel with the page.
- Obliteration** Erasure or destruction of original information on a document.

- Occipital condyles** Pair of small, slightly rounded projections of the occipital bone, at the base of the cranium near the spinal cord opening, that form a joint with the first cervical vertebra.
- Occlusal surface** Surface of a tooth, which during chewing, comes in contact with teeth from the opposing jaw.
- Odontology** Dentistry; the study of the biology and repair of the teeth. The adjective form is *odontological*.
- Opacity** Imperviousness to the passage of light.
- Opiates** A term for the class of narcotic drugs derived from the opium plant, including morphine and codeine. Heroin is produced from morphine.
- Organic compounds** Class of chemical compounds with carbon bases; all hydrocarbons are organic compounds.
- Organized offender** Exhibits a great deal of thought and planning. The offender maintains control over himself and the victim. Little or material of evidentiary value is present. Organized crime is carried out in a sophisticated and methodical manner.
- Origin determination** Observing a fire scene, collecting and analyzing evidence, and conducting interviews with witnesses to determine where the fire began.
- Original equipment (OE) tire** Original tire installed on a new vehicle.
- OSHA** Occupational Safety and Health Act that defines universal precautions for all types of work environments.
- Ossification** Formation of bone from cartilage or other fibrous tissue.
- Ossification centers** The areas of bone where development and growth occur gradually replacing cartilage.
- Osteoarthritis** Deterioration in joint integrity connected with use-wear, exacerbated by inflammation and related to reduction in bone density.
- Osteology** Study of skeletal biology. The adjective form is *osteological*.
- Osteometry** Scientific measurement of a skeleton. The adjective form is *osteometric*.
- Overkill** Administering more trauma than necessary to end a life; overkill indicates personalized anger and suggests the offender knew the victim.
- Ovoid bodies** Microscopic structures occasionally observed in the cortex of hair.
- p-Dimethylaminocinnamaldehyde (DMAC)** Indicator chemical used to detect ammonia when urea is catalyzed by urease; used forensically to detect urine.
- Palmer method** Style of writing taught in schools.
- Paper opacity** See opacity.
- Parent drop** Drop of blood from which a wave castoff or satellite spatter originates.
- Patching** Addition of a written stroke to improve a defect in a written line.
- Patent** A term used by latent print examiners to indicate *visible*; the opposite of *latent*.
- Pathology** Medical specialty dealing with the diagnosis of disease by examining tissues and fluids.
- PCR** Polymerase chain reaction; copying complementary strands of target DNA in a series of cycles or rounds to produce a large number of copies of the original strands.
- PCR primer** DNA replication requires a primer to add nucleotides to a growing chain. *In vitro* replication in which a specific set of oligonucleotides is used to flank a target gene using oligonucleotides known as PCR primers.
- PD** Acronym for physical developer.
- Pedigree** Graphic method for summarizing data on the inheritance of particular phenotypes. Generally, squares represent males, circles represent females, parents are joined by horizontal lines, and parents are joined to offspring by vertical lines. Offspring are attached to each other by horizontal lines.
- Pen lift** Break in a written line.
- Penmanship** Style of writing.
- Pen pressure** Amount of force applied to a pen or pencil while writing.
- Perimortem** At or around the time of death.
- Periodic acid Schiff (PAS) test** Presumptive test for the presence of vaginal material; glycogenated cells are stained bright magenta.
- Periodontal ligament** The specialized connective tissue ligament that holds the tooth in the alveolus.
- Permanent dentition** The 32 adult teeth.
- Personality test** Any of a number of psychological tests that evaluate personality, psychopathology, and mental functioning.
- Peyote** The common name for the small Mexican cactus, *Lophophora williamsii*, that contains the hallucinogen, mescaline.
- pH** The negative logarithm of the hydrogen ion concentration in a solution. The degree of acidity present.

- Phadebas™ reagent** Commercial chemical consisting of a dye cross-linked to an insoluble starch. Upon digestion of the starch by amylase, the dye is released into solution. The intensity of color relates to the level of amylase present.
- Phencyclidine (PCP)** A drug originally developed as a surgical anesthetic that was discontinued due to adverse patient reactions. Abusers of this drug often experience severe psychiatric manifestations.
- Phenol** Toxic chemical used in the extraction of DNA from a cell.
- Phenotype** The expressed characteristic of the genotype. Can be tested for and identified.
- Physical anthropology** Study of the biology, variation, and evolution of the human species.
- Picking** Adherence of a drug to the face of the punch used to produce a tablet. Picking creates holes in the surfaces of pressed tablets, usually near letters such as A or R.
- Picroindigocarmine (PIC)** Dye used to differentially stain spermatozoa for ease of identification. It stains the tail and midpiece green and the anterior head light pink.
- Pistol** A handgun; sometimes used to describe semiautomatic handguns.
- Pixel** Small continuous tone spots that comprise a digital image. *Pixel* is a combination of *picture* and *element*.
- PPI** Pixels per inch.
- Plaintiff** the injured party in a civil legal action.
- Plasma** The fluid portion of blood.
- Plastic** Indentation fingerprint impressed into a soft receiving surface; a plastic print has distinct three-dimensional character.
- Plastic deformation** Nonelastic change in shape; warping.
- Platters** Multiple rotating disks on a hard drive that are usually read and written on both sides.
- Point of origin** Precise point where an ignition source, fuel, and oxidizer unite to create a fire.
- Point or area of convergence** A point or area to which a bloodstain pattern can be projected on a two-dimensional surface; determined by tracing the long axes of well-defined bloodstains within the pattern back to a common point or area.
- Point or area of origin** Three-dimensional point or area from which the blood that produced a bloodstain originated; determined by projecting angles of impact of well-defined bloodstains back to an axis constructed through the point or area of convergence.
- Polar coordinates** Method of crime scene measurement; measurement of items of evidence based upon their distances and angles from a fixed position.
- Polarized light microscope (PLM)** A microscope equipped with two polarizing elements positioned in the optical path of the microscope.
- Polymerase** Enzyme that serves as a catalyst in the formation of DNA and RNA.
- Polymorphism** The occurrence in a population of two or more genetically determined alternative phenotypes with frequencies greater than could be accounted for by mutation or drift.
- Postconviction hearing** Hearing granted upon a motion raising evidentiary issues. Such hearings often occur a significant time after conviction and are typically unsuccessful.
- Postoffense behavior** Behavior of a suspect within hours, days, and weeks after a crime. Such behavior distinguishes the offender from the rest of the suspect population.
- Postmortem** After death.
- Postmortem drug testing** Examinations performed on blood, urine, and/or body tissues to determine if drugs were a contributing factor in a death.
- PPE** Personal protective equipment; items such as gloves, face or eye shields, face masks, protective suits, and shoe covers that help minimize exposure to hazardous products.
- Precipitin reaction** An antigen-antibody reaction in which the result is a precipitate, usually visible.
- Precision** Ability to achieve the same result; reproducibility.
- Preoffense behavior** Behavior of an offender just before committing a crime. Often, a precipitatory stressor is the catalyst for the commission of a violent crime.
- Presumptive test** A chemical test which, by production of color or light, indicates the presence of a body fluid of forensic interest (blood, semen, etc.).
- Primary crime scene** Description of a crime scene based on the location of the original criminal activity; the original scene.
- Primary dentition** The 20 baby teeth.
- Primer** Small piece of single-stranded DNA used for replication.
- Proficiency test** Simulated forensic case.

- Profile** Description of the results of an investigative analysis of an unsolved crime of violence; may cover victimology, crime reconstruction, significant facts of the autopsy, characteristics and traits of the offender, postoffense behavior, and investigative suggestions.
- Projected blood pattern** Pattern created when blood is projected or released as the result of force.
- Projective test** Psychological test based on the notion that if an individual is shown an ambiguous stimulus and asked to respond, his responses will reveal aspects of his personality, including inner thoughts, wishes, conflicts, and feelings.
- Prognosis** the predicted outcome of a patient's condition.
- Prostate-specific antigen (PSA, p30)** A 30-kD protein originating in the prostate gland; used forensically to confirm the presence of azoospermic semen following a positive presumptive test result.
- Proteinase** Enzyme that degrades polypeptides by facilitating the breakage of peptide bonds between amino acids.
- Proteinase K** Enzyme commonly used to degrade proteins.
- Proximal** Nearest the center or point of attachment. In hair morphology, the root is the proximal end.
- Pseudogene** Inactive DNA sequence usually derived from an adjacent active sequence. The inactive sequence is activated by accumulation.
- Pseudomalingering** A phenomenon whereby a mentally ill individual feigns the mental illness he actually has. The behavior is considered a temporary ego-supportive device that allows the individual to feel he has control over his illness.
- Psilocin** Controlled hallucinogenic substance contained in the psilocybe mushroom.
- Psilocybin** Controlled hallucinogenic substance contained in the psilocybe mushroom.
- Psychological testing** Quantitative or quasi-quantitative evaluation of personality, psychopathology, and mental functioning.
- Pubic symphysis** Immovable joint formed by fibrous tissue and cartilage where the pubic bones (left and right pelvis) meet in the middle front of the abdomen.
- Pulp** The neurovascular tissue in the center of a tooth.
- Pupa (pl. pupae)** The stage between the larvae and the adult in insects having a complete metamorphosis.
- Pupal cases** The covering from which adult flies emerge and leave the body.
- Purine** A nitrogen base; the purine bases in DNA and RNA are adenine and guanine.
- Putative** Suspected or alleged, as in parentage.
- Pyridine** Common chemical used to dissolve ink components for thin layer chromatography.
- Pyrimidine** Nitrogenous base of which thymine is found in DNA; uridine in RNA; and cytosine in both RNA and DNA.
- Quad compressors** Surveillance cameras recorded on a videotape in which the image is divided into four parts for four cameras.
- Qualitative analysis** The determination of the identity of a substance.
- Quality assurance** Guarantee of value.
- Quantitative analysis** The determination of the amount of a particular substance present in a material substance.
- Questioned document** Document whose authenticity or origin is suspect.
- Racemic mixture** Combination of the different types of stereoisomers of the same compound.
- Radial cracks** Those fractures that originate from the impact point and propagate away.
- Ramus of the mandible** The vertical portion of the lower jaw that communicates with the skull.
- Recoil operation** An operating principle of automatic and semiautomatic firearms. When the weapon is fired, the barrel and breechblock initially recoil together. After traveling a short distance, the barrel and breechblock unlock and the breechblock continues to travel to the rear, extracting and ejecting the expended cartridge. See *blowback* and *gas operation*.
- Reconstruction evidence** Evidence of the events leading to, occurring during, and occurring after a crime is committed.
- Relative retention time (RRT)** Ratio of the retention time of the substance of interest divided by the retention time of an internal standard run on the same gas or liquid chromatographic system at the same time.
- Repetitive DNA** DNA consisting of copies of the same or nearly the same nucleotide sequence; DNA sequences that are present in many copies per chromosome set. Repetitive DNA sequences may be closely linked as in satellite DNA or VNTR loci or dispersed throughout the genome or parts of the genome like the *alu* family of repetitive elements.
- Request standards** Handwritten standards issued in the presence of an investigator or examiner.

- Resolution** Measurement in units per inch of the amount of detail in an image file: dpi = dots per inch; ppi = pixels per inch; lpi = lines per inch.
- Restriction enzyme** Endonuclease that will recognize a specific target sequence of nucleotides in DNA and break the DNA chain at that point.
- Retention time** Time required for a substance to travel from the injection port to the detector in a gas or liquid chromatographic system.
- Retouching** Going back over a written line to correct a defect or improve its appearance; synonymous with patching.
- Retread tire** Tire carcass to which new tread rubber is added to produce a reusable tire.
- Revolver** Handgun that holds cartridges in a rotating cylinder.
- RFLP** Restriction fragment length polymorphism. Variation in banding patterns of DNA fragments generated by restriction digests. Polymorphic minisatellite repeats flanked by restriction enzyme recognition sites.
- Ribosomal RNA gene** Gene cluster that codes for the structural RNAs found in the ribosome. About 2000 copies of the 5S RNA gene are clustered in tandem on chromosome 1; tandem arrays of the genes for 28S, 5.8S, and 18S rRNA genes are found in clusters of roughly 50 repeats on chromosomes 13, 14, 15, 21, and 22 in humans.
- Richter scale** Arbitrary logarithmic scale used to measure and compare ground motion caused by seismic activity.
- Ricochet** Alteration of bullet trajectory by collision with a liquid or solid surface.
- Ricochet or secondary splash** Deflection of large volumes of blood after impact with a target surface that stains a second surface; does not occur when small drops of blood strike a surface.
- Rifle** Any rifled firearm including 16-inch naval guns; a firearm having a rifled barrel and designed to be fired from the shoulder.
- Rifling** System of spiral lands and grooves cut into the interior of a gun barrel; imparts rotation to fired bullets, improving their accuracy.
- Rigor mortis** Stiffening of the body after death due to the chemical breakdown of actin-myosin and the depletion of glycogen from muscles. A time-dependent change that helps determine time of death.
- Rimfire cartridge** Firearm cartridge in which the primer compound is placed within the rolled rim of the casing. The firing pin strikes the rim of the cartridge.
- Rosin** Sizing material made from turpentine gum. It is added to paper during manufacture. See *sizing*.
- Rule 702** A federal rule of evidence that permits an expert who is qualified by experience, training, or education to offer an expert opinion if the scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue. This rule was amended in 2000.
- Sacroiliac joint** Joint formed by the sacrum and both side of the pelvis (iliac bones).
- Sacrum** Portion of the lower part of the spine below the lumbar vertebrae and above the coccyx that forms a joint with the left and right pelvis. The adjective form is *sacral*.
- Saliva** Oral secretion comprised of water, mucus, proteins, salts, and enzymes. Its primary functions are to moisten the mouth, lubricate chewed food, and aid digestion.
- Sample** An entire submitted exhibit or subsample of the exhibit.
- Satellite DNA** Highly repetitive eukaryotic DNA mainly located around centromeres and found in other places in the genome. The buoyant density of satellite DNA is usually different from that of the other DNA of a cell. The repetitive DNA forms a satellite or off-the-bell-curve fraction in a density gradient because of the base compositions of the repetitive regions.
- Satellite spatter** Small droplets of blood projected around a drop of blood upon impact with a surface. A wave castoff is considered a form of satellite spatter.
- Scallop pattern** Bloodstain produced by a single drop characterized by a wave-like, scalloped edge.
- Scanning electron microscope (SEM)** A microscope that permits viewing of samples at much greater magnification and resolution than is possible by light microscopes. Magnification is possible in the range of 10 to 100,000 \times .
- Scavenger** Organism that feeds on dead organisms.

- Schlieren optics** Imaging system in which the transparent or translucent object to be examined is placed between two spherical mirrors. The illuminant is a point light source placed at the focal point of one of the mirrors. Parallel light rays from the mirror pass through the object to the second mirror, which projects the image onto a screen. A knife edge is placed at the focal point of the second mirror to block unrefracted light rays. Only light rays refracted by the object reach the screen. Schlieren optics can produce images of thickness, density, and refractive index differences.
- Sciatic notch** Indentation in the lower part of the hipbone (ischium), through which the sciatic nerve extends.
- Scrape cutter** Rifling tool having one or two raised cutting edges that cut the grooves of rifling.
- Script system** An image database for handwriting comparison developed in The Netherlands.
- Second instar** Second-stage fly larvae resulting from molting of first-star larvae that can penetrate skin by using proteolytic enzymes and rasping action of their mouthparts.
- Secondary crime scene** Crime scene location after the original or primary crime scene.
- Sectors** Groupings of data on a single disk track.
- Selenium** Nonmetallic element sensitive to light; used as a coating on drums of photocopying machines.
- Semen** Complex mixture of organic and inorganic substances produced in the postpubertal male genital tract.
- Semiautomatic weapon** Firearm that fires and reloads itself before firing another shot; a self-loading weapon.
- Sequence of strokes** The order in which ink lines that cross each other were written.
- Sequential switchers** Surveillance cameras recorded on a videotape in a sequential method.
- Seriation** Analytical technique whereby a group of specimens is placed in a graduated order or series according to a trait or group of traits.
- Serum** The fluid portion of the blood minus the clotting factors and formed elements. Contains antibodies and other serum proteins.
- Serum stain** Clear, yellowish stain with a shiny surface often appearing around a bloodstain after the blood retracts due to clotting. The separation is affected by temperature, humidity, substrate, and/or air movement.
- Sexual psychopath laws** Legislation intended to regulate the evaluation, treatment, and legal disposition of convicted sex offenders.
- Sexual ritualism** A series of acts committed by an offender that are unnecessary to the accomplishment of the crime. The offender repeats the acts over a series of crimes. The intent is to increase psychosexual gratification. Ritualism should not be confused with *modus operandi*.
- Shading** Contrast between the written upstroke and downstroke of a line.
- Shadow graph** Image of a transparent or translucent object produced on a screen or photographic paper when the object is illuminated by light from a point source. Minute variations in thickness are accentuated.
- Sharpey's fibers** Specialized fibers that connect both the tooth and the alveolar bone to the periodontal ligament.
- Shored exit wound** A bullet exit wound that has many characteristics of a distant entrance wound. It is caused by supporting or shoring the skin as the bullet exits.
- Shotgun** Smoothbore firearm designed to be fired from the shoulder.
- Sign of elongation** Microscopic characteristic of anisotropic material. It is positive (+) when the vibration direction of light along the length of the particle has a higher refractive index.
- Signature** A killer's psychological calling card left at each crime scene across a spectrum of several murders. Characteristics that distinguish one murder from all others.
- SINE** Acronym for short interspersed nuclear element.
- Singleton** A single (simple) nucleotide polymorphism appearing in less than 5 percent of the population.
- Sipe** Small groove in a tire design element intended to provide better traction. Sipes vary in depth and are useful for documenting tire wear.
- Size marker** Variable number of tandem repeats in FLP or STR form.
- Sizing** Material added to paper to change its smoothness, finish, absorbency, and appearance.
- Skeletonized bloodstain** Bloodstain consisting only of an outer periphery after the central area is removed by wiping when the liquid was partially dried; can also be produced by flaking away of the center of a completely dried stain.
- Skid mark** Mark on the surface of a fired bullet made when the edges at the beginning of the rifling scrape the bullet surface or when the nose of the bullet slides on the surface of the forcing cone of a revolver barrel.
- Skill level** Proficiency of handwriting; line quality is a good indication of skill level.

- Slack space** The hidden space on a disk where DOS attempts to write a file to clear its RAM memory.
- Slant** Angle of writing with respect to a baseline.
- SLICE** Spectra library for identification and classification engine. A database for the archiving of x-ray spectra.
- Slippage** Mark on the surface of a fired bullet made when the bullet slides along the tops of the lands of the rifling. Slippage marks appear when the rifling is worn or when a subcaliber bullet is fired.
- Smear** Large volume of blood, usually 0.5 milliliters or more, that is distorted so that further classification is impossible. A smear is similar to a smudge, but is produced by a larger volume of blood.
- Smokeless powder** Propellant composed of nitrocellulose (single-base powders) or nitrocellulose plus nitroglycerin (double-base powders). Smokeless powders contain additives that increase shelf life and enhance performance. They are made in a variety of shapes (rods, perforated rods, spheres, disks, perforated disks, and flakes).
- Smudge** Bloodstain so distorted that no further classification is possible.
- SNP** Acronym for single nucleotide polymorphism (pronounced *SNIP*). A one-nucleotide change or difference from one individual to another.
- Sole or outsole** Part of a shoe that touches the ground.
- Somatic** Referring to the body or its structure.
- Souvenir** Personal item belonging to the victim of a violent crime which is taken by the offender, for example, jewelry, clothing, a photograph, or driver's license. The item serves as a reminder of a pleasurable encounter and may be used for masturbatory fantasies. The offender who takes a souvenir is usually an inadequate person who is likely to keep it for a long time or give it to a significant other.
- Spatter** Dispersion of small blood droplets due to the forceful projection of blood.
- Specialized forensic assessment techniques** Specialized psychological tests and structured interviews focusing directly on a specific legal standard, question, or issue.
- Spermatozoan** Male reproductive cell contained in semen.
- Spines** Pointed edge characteristics that radiate away from the center of a bloodstain. Formation depends on impact velocity and surface texture.
- Splash** Bloodstain pattern (0.1 milliliter or more) created by a low velocity impact on a surface.
- Spoliation of evidence** Intentional or negligent destruction or alteration of evidence.
- Stab wound** Incised wound that penetrates farther than the maximal surface dimension.
- Stabilizer** Additive to smokeless powder that reacts with acidic breakdown products of nitrocellulose and nitroglycerin. Diphenylamine and ethyl centralite are common stabilizers.
- Stage micrometer** A microscope slide with a scale usually divided into 10-micrometer or 0.001-inch units. It is used to calibrate the eyepiece scale of a microscope used for measuring.
- Staged scene** A crime scene in which someone (usually the offender) arranges the scene or commits certain acts to have the scene convey a motivation different from the original motive or mislead investigators.
- Standard of care** The usual and customary practice of a profession in a community.
- Starch-gel electrophoresis** A method that uses purified starch-gel as a support medium to hold proteins while they are separated in an electric field.
- Static load** Load or force that does not change; it creates no net motion. Static loads balance each other.
- Stellate defect** Star-like tearing of soft tissue seen in contact wounds of the head or sternum.
- Stereo binocular microscope** Two similar but separate optical microscopes for observation by both eyes simultaneously for low to medium magnification in the range of 4 to 40x.
- Stereoisomers** Compounds with identical structural formulas; they differ in the way their molecules are arranged.
- Sternum** Breastbone. The adjective form is *sternal*.
- Sticking** Adherence of a drug formulation to the walls of a die used to produce tablets. Sticking causes unreproducible striations on the edges of the tablets.
- Stimulant** Drug that produces a temporary increase of functional activity or efficiency.
- Stippling** Disposition of fragments of powder into the skin as the result of a gunshot wound of relatively close range; also called powder tattooing.
- Striae** Noninked grooves left behind in an ink line by imperfections in the ball or ball housing of a pen.

Striation Fine scratch used in the microscopic comparison of bullets and tool marks. Striations are made by minute imperfections inside a gun barrel or on the surface of a tool.

Stringency Variable condition, such as temperature or salt concentration, used in renaturation assays.

Structural isomers Compounds that contain the same numbers and types of atoms but differ in the order of arrangement of the atoms. The types include chain, positional, and functional isomers.

Submachine gun Automatic weapon that fires pistol cartridges.

Subpubic angle Angle formed where the left and right pubic bones meet in the middle front of the body.

Subrogation Substituting one creditor for another as when an insurance company seeks to recover the costs paid to an insured by a manufacturer or service installer if the manufacturer's product can be shown to have inherent design flaws or the service provider engaged in negligent behavior.

Superglue™ 2-Methyl and ethyl esters of cyanoacrylate; manufactured as an adhesive, and incidentally found to be useful in latent fingerprint development. See *cyanoacrylate fuming*.

Swaging Rifling method in which a rifling button is forced down a drilled-out barrel blank. The button simultaneously expands the barrel to its final diameter and embosses the lands and grooves on the interior.

Swap files Files used by Windows® for various functions, including temporary memory.

SWG Scientific working group; a representative group of practitioners in a forensic science specialty assembled to formulate and periodically review consensus standards for the specialty, including training, education, quality assurance, and interpretation of results.

SWGFAST Scientific Working Group on Friction Ridge Analysis, Study, and Technology; formed in 1995 for fingerprint and other friction ridge skin comparison and identification.

Swipe Transfer of blood onto a surface not already contaminated with blood. One edge is usually feathered and may indicate the direction of travel.

Tandem array Duplicated, triplicated, etc. arrangement in which the duplicated DNA segment is adjacent to the original and in the same order.

Taphonomy From the Greek taphos (burial or grave) and nomos (laws), literally translated as the laws of burial. In forensics, refers to the postmortem fate of human remains.

Taq polymerase Polymerase that can function at very high temperatures, typically above 95 degrees Celsius; synthesized from the thermophilic bacterium, *Thermus aquaticus*.

Target Surface upon which blood is deposited.

Telogen stage The dormant or resting phase of hair growth. Hair in the telogen phase is shed naturally.

Terminal velocity Maximum speed to which a free-falling drop of blood can accelerate in air; about 25.1 feet per second.

Test impression Impression made by using a known shoe or tire as a standard; used in the examination of shoe and tire impressions.

Tetranucleotide repeat Repeat of four nucleotides; member of a common class of repeats called microsatellites; generally referred to as short tandem repeats.

Thin layer chromatography The use of a solvent that travels through a porous medium to separate compounds by their chemical reactivity with the solvent.

Third instar Third-stage fly larvae that frequently aggregate in large masses and are voracious feeders.

Threat assessment Analysis of written or verbal communications containing direct or implied threats to harm or injure individuals, industries, institutions, or government agencies. The communication is analyzed for content and stylistic characteristics. Analysis may include a profile of the unknown perpetrator and evaluation of the unknown subject's potential to carry out the threat.

Three-dimensional impression Impression that has length, width, and depth.

Thymine (T) One of the four nucleotide bases in DNA. The others are adenine, guanine, and cytosine.

Tire impression When a tire contacts a surface, it results in the transfer of the class characteristics of design and size and possibly of wear and individual characteristics.

Tire track The path a tire makes when it crosses a surface.

Tire tread Part of a tire that contacts the road surface and contains a design.

TLC Wet chemical test known as thin layer chromatography.

- Trabecular bone** Spongy bone tissue forming a lace-like matrix of connective tissue strands; found beneath cortical bones.
- Trace analysis** Qualitative or quantitative analysis of the minor or ultraminor components of a sample.
- Trace evidence** Historically, a term used to describe any evidence small in size, such as hairs, fibers, and soil samples, that would be analyzed utilizing microscopical techniques.
- Traced forgery** Fraudulent signature produced by following the outline of a genuine signature.
- Track width (vehicle stance)** Measurement from the center of one wheel to the center of the opposite wheel on the same axle.
- Trailer** Pattern of poured or solid material, for example, a linear pour of a liquid accelerant or distribution of twisted sheets of paper that will lead a fire from one location to another.
- Transcription** Construction of an RNA molecule from a DNA template.
- Transfer evidence** Evidence exchanged or transferred from one location or source to another.
- Transfer pattern** Contact bloodstain created when a wet, bloody surface contacts a second surface as the result of compression or lateral movement. A recognizable mirror image or a recognizable portion of the original surface may be transferred to the second.
- Transient evidence** Temporary or easily lost evidence at a crime scene.
- Transition** Nucleotide-pair substitution involving the replacement of a purine with another purine, or a pyrimidine with another pyrimidine, for example, GC with AT.
- Transposon** Short DNA sequence, usually shorter than 15 kb; it has the ability to jump around the genome and insert itself.
- Transversion** Nucleotide-pair substitution involving the replacement of a purine with a pyrimidine, or vice versa, for example, GC with TA.
- Trash mark** Mark left on a finished copy during photocopying; results from imperfections or dirt on the cover glass, cover sheet, drum, or camera lens of a photocopy machine.
- Tread design guide** Annual publication that shows thousands of tire designs.
- Tread wear indicator (wear bar)** Raised rubber bar 1/16 inch above the bases of the tire grooves; it must appear at least six times on a tire.
- Tremor** Wavy back-and-forth movement on a written line.
- Triangulation** Method of measurement of a crime scene and physical evidence; every item of evidence is measured from two fixed points.
- Trigger pull** Force required to pull the trigger of a firearm and cause it to discharge.
- Trinucleotide repeat** Three nucleotides repeated in tandem. The repeats are sometimes associated with disease loci and fall within the class of microsatellite repeats.
- Trophy** Personal item belonging to the victim of a violent crime which is taken by the offender, for example, jewelry, clothing, a photograph, or driver's license. The item serves as a reminder of a pleasurable encounter and may be used for masturbatory fantasies. The offender who takes a souvenir is usually an inadequate person who is likely to keep it for a long time or give it to a significant other.
- Turning diameter** Diameter of the circle a vehicle makes when its steering wheel is fully turned; the tightest turn a vehicle can make.
- TWG** Technical working group. A precursor of the SWG. It served the same purpose in a forensic specialty area. Some TWGs still operate.
- TWGDAM** Technical Working Group on DNA Analysis Methods that publishes guidelines for DNA quality assurance and proficiency testing.
- Two-dimensional impression** Impression that has length and width, but no significant depth.
- Typewriting system** Typewriting device consisting of a machine, ribbon, and font.
- Ultraviolet** Area of the light spectrum just past visible violet and before the x-ray region.
- Ultraviolet spectroscopy** Use of the absorption of ultraviolet radiation to classify a substance.
- Unallocated space** The hidden space on a disk taken up by the "real" file when erasing it.
- Undetermined cause** Destruction accompanying some fires may be too extensive to allow determination of the origin and/or cause with a high degree of confidence.
- Urea** Nitrogenous compound formed from the catalysis of amino acids; found in high levels in urine.
- Urobilinogen** Intermediate product in the metabolism of bilirubin. When combined with zinc acetate, it forms a compound that fluoresces in ultraviolet light; used for the identification of feces.
- V-shaped pattern** Fire pattern seen when a flame impinges on a vertical surface.
- Variant** Organism that is recognizably different from a so-called standard type in the species.

Ventricular fibrillation Uncoordinated non-propulsive quivering of the heart often produced by myocardial infarction or heart attack; also produced by low voltage electrocution.

Vestibule The circular space formed by the meeting of the cheeks and the jaw.

Victimology Victim's history (personality characteristics, strengths and weaknesses, occupation, hobbies, lifestyle, and sexual history) that impacts the analysis of a crime; a behavioral study of the victim of a violent crime (usually homicide). The analyst examines reputation, lifestyle, habits, associates, and pastimes to form an opinion about the individual's risk of becoming the victim of a violent crime.

Video spectral comparison Comparison and differentiation of inks by analyzing the infrared reflecting and luminescing qualities inherent to the ink; most often accomplished using a device made by Foster & Freeman, Ltd.

Vitreous humor Ocular fluid (fluid within the eye) that is often utilized as a sample for testing in postmortem toxicology.

Void or shadow Absence of bloodstain in an otherwise continuous bloodstain pattern. The geometry of the void may suggest an outline of the object that intercepted the blood, for example, furniture, a shoe, or a person.

VNTR locus Chromosomal locus at which a particular repetitive sequence is present in different numbers in different individuals of a population; a simple sequence tandem repeat polymorphism in which the core repeat unit is usually 250 bases long.

Wad Cardboard, fiber, or plastic disk found in shotshells; may be placed between the powder and the shot or over the shot.

Walk-through Preliminary crime scene survey performed to orient the crime scene investigator to the scene and the physical evidence at the scene.

Watermark Translucent design impressed into paper during manufacture. The design becomes visible when the paper is subjected to transmitted light and helps date a document.

Wave castoff Small blood droplet originating from a parent drop of blood caused by wave-like action of the liquid when it strikes a surface at an angle smaller than 90 degrees.

Wear Effect of frictional forces on a tire or shoe; wear eventually changes the design.

Wet origin impression Footwear impression containing significant moisture from the shoe sole or substrate.

Wheelbase Measurement between the centers of the hubs of the front wheels to the centers of the hubs of the rear wheels; it is very difficult to measure from the tracks made by a vehicle.

Wheellock Weapon in which ignition of the propellant is accomplished by a rotating wheel striking sparks from a piece of iron pyrite.

Wild type Genotype or phenotype found in nature or in standard laboratory stock; can also be a phenotype first observed in the wild.

Wipe Bloodstain pattern created when an object moves through an existing bloodstain, removes blood from the existing stain, and alters its appearance.

Workplace drug testing Examinations performed on primarily blood and urine from employees or job applicants for drug content.

X-ray diffraction The targeting of a beam of monochromatic x-rays on a sample so that the radiation is scattered. This technique indicates how the atoms or molecules are arranged in a given crystal.

X-ray fluorescence Technique based on the emission of characteristic x-ray radiation when a sample is exposed to exciting radiation from more energetic x-rays. The spectra are displayed as intensity versus energy or wavelength.

Yaw angle Angle between the axis of a bullet and its trajectory

Yawing Deviation of a bullet from the longitudinal axis of its flight.

Zaner-Bloser Style of writing taught in schools.