

THE LAW OF FORENSICS IN UGANDA

**A PROOF BEYOND THE
SHADOW OF DOUBT**



Isaac Christopher Lubogo

THE
LAW
OF FORENSICS IN UGANDA

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First Edition

©2021

ISAAC CHRISTOPHER LUBOGO



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Tel: +256 414 660 286, +256 782 395 293,

+256 702 055 211, +256 752 055 211

E-mail: jeschogroupltd@gmail.com

Website: www.jeschogroupltd.co.ug

A B O U T T H E B O O K

Everything is a self-portrait, a diary, your whole drug history's in a strand of your hair. Your fingernails the forensic details the lining of your stomach is a document. The calluses on your hand tell all your secrets. Your teeth give you away. Your accent, the wrinkles around your mouth and eyes, everything you do shows your hand. (Chuck Palahniuk)

This book gives an understanding of the application of forensic sciences to the law. It covers the crime scene investigation process, and provides an overview of the various kinds of forensic evidence that may be collected and presented in court. Points out the identification, documentation and collection of physical evidence, including fingerprints, shoe impressions, hair fibers, firearms evidence and questioned documents, It considers biological evidence, including DNA, and tries to analyze the scientific unimpeachability of DNA, blood spatter and other fluids, forensic anthropology and odontology. Finally, the book engages fire investigation and forensic accounting.

It is designed to provide a foundation in the field of criminalistics to who are interested in the use of science and law to solve crime, and considers the impact of television and other media on the field of Forensic Science and the courtroom.

“...if the glove doesn't fit the hand then you must acquit...”

Jonny l. Cochran in the Trail of the century the O.J Simpsons Case



DEDICATION

To the great I AM the God of Abraham, Isaac and Jacob, The Lord God most High, my High Tower, my Refuge, my Redeemer, my Salvation, my Refuge; to you Oh God even The Lord God my Lord, my Divine comforter, You who by all things are possible.... the "Wind" my only Hope and Eternal breath... blow on me my God and my King forever and ever your the Ancient of days.... This is for YOU and YOU ALONE.

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A C R O N Y M S

CILC:	Centre for international Legal Cooperation
CSI:	Crime Scene Investigators
DPP:	Director of Public Prosecution
FSD:	Forensic Science Department, Uganda
GAL:	Government Analytical Laboratories
NFI:	Netherlands Forensic Institute
TMFI:	The Maastricht Forensic Institute
UPF:	Uganda Police Force
UNODC:	Uganda National Office on Drugs and Crime

CHAPTER ONE



ORIGIN OF FORENSIC SCIENCE'S ETYMOLOGY, EVOLUTION, AND BEGINNINGS

Forensic science finds its origin around the mid 17th century especially from Latin which holds the word “*forensic*” meaning, ‘*in open court, public*’. The meaning of Forensics is related to the use of scientific knowledge or methods in solving crimes: relating to, used in, or suitable to a court of law: Forensic science is the application of science to criminal and civil laws. Forensic scientists are tasked with the collection, preservation, and analysis of scientific evidence during the course of an investigation. There is urgent and widespread need for the application of forensic science in criminal investigation. The present-day picture of crime investigation and prosecution of criminals is a sad story. A large percentage of the murder trials, ultimately, end in acquittal. It is estimated that the prosecution agencies spend on an average over 3000 USD’s per trial globally. Thus, not only a dangerous criminal goes scot free but huge amount of public money is also wasted. These frequent acquittals also embolden the criminals.¹

Forensic Science in criminal investigations and trials is mainly concerned with materials and indirectly through materials with men, places and time. Among

¹ Crime Scene Investigation A Guide for Law Enforcement Project Director: Kevin Lothridge
Project Manager: Frank Fitzpatrick National Forensic Science Technology Center 7881 114th
Avenue North Largo, FL 33773

men, the investigating officer is the most important person. In fact, it is he whose work determines the success or failure of the application of forensic science in the processing of a criminal case. If he fails to collect the relevant evidence, allows the exhibits to be contaminated or does not provide correct samples for comparison, the findings of a forensic scientist will be useless. Forensic Science embraces all branches of science and applies them to the purpose of law. Originally all the techniques were borrowed from various scientific disciplines like chemistry, medicine, surgery biology, photography. But in the past few years it has developed its own branches which are more or less exclusive domains of forensic science. More recently significant advances have been made in serology, voice analysis, odour analysis and in studies relating to nose prints and ear patterns.

The need for the application of science in criminal investigation has arisen from the following factors:

Social Changes: The society is undergoing drastic social changes at a very rapid pace. India has changed from a colonial subject race to a democratic republic. Sizeable industrial complex has sprung up. The transport facilities have been revolutionized. There is a growing shift from a rural society to an urban one. These changes have made the old techniques of criminal investigation obsolete. In the British days the police was so much feared that once it had laid its hands upon an individual, he would ‘confess’ to any crime, he may not have even known. The fear is vanishing now. The use of ‘third degree’ techniques used in those days does not find favour with the new

generation of police officers and judges.

Hiding facilities: The quick means of transport and high density of population in cities have facilitated the commission of crimes. The criminal can hide himself in a corner of a city or move away to thousands of miles in a few hours. He, thus often escapes apprehension and prosecution.

Technical knowledge: The technical knowledge of an average man has increased tremendously in recent years. The crime techniques are getting refined. The investigating officer, therefore, needs modern methods to combat the modern criminal.

Wide field: The field of activities of the criminal is widening at a terrific rate. Formerly, the criminals were usually local, now we find that national or international criminal is a common phenomenon. Smuggling, drug trafficking, financial frauds and forgeries offer fertile and ever expanding fields.

Better Evidence: The physical evidence evaluated by an expert is objective. If a fingerprint is found at the scene of crime, it can belong to only one person. If this person happens to be the suspect, he must account for its presence at the scene. Likewise, if a bullet is recovered from a dead body, it can be attributed to only one firearm. If this firearm happens to be that of the accused, he must account for its involvement in the crime. Such evidence is always verifiable.

Forensic science provides answer to the following three questions:

1. Has a crime been committed? Consider the case of recovery of a dead body. Death could be natural accidental or homicidal. Forensic Science by ascertaining the nature of death, establishes the existence or absence of corpus

delicti.

2. How and when was the crime committed? The examination of the 'corpus delicti' reveals the way of the crime was committed and possibly the time when it was committed.

3. Who committed the crime? Forensic science establishes the identity of the culprit through personal clues like fingerprints, footprints, blood drops or hair. It links the criminal with the crime through objects left by him at the scene with the victim or carried from the scene and the victim.

On the other hand, if the clues recovered do not link the accused with the victim or the scene of occurrence, the innocence of the accused is established. Forensic science, thus, helps the innocent.

The application of Forensic Science in the investigation of crime can be effective only if the investigating officer knows: The nature of physical evidence to be collected, where it is found, How it is collected and packed, What standard samples for comparison purposes are necessary, How much sample is required, How the sampling is done, How the evidence will link the crime with the criminal and to what extent his labors will be rewarded by the laboratory results.

This is possible if the investigating officer is given a thorough grounding in the above aspects. He needs both theoretical and practical training. All police training institutions have courses in scientific aids, but the syllabi and the teaching standards are far from satisfactory. Periodical attachment of investigating officers to the departmental forensic science laboratories can go a long way in inculcating the scientific spirit.

Ignorance about the value of evidence sometimes causes a lot of disappointment to an investigating officer. For example, hair is recovered in quite a few cases. Evaluation of hair does not lead to positive identification of the source of hair. It is not possible at the present stage of development of the science. They would not be disappointed, if they know the limitations.

The history of forensic science has yet to be discovered, as forensic science as a discipline has received little attention until lately. As one has a better understanding of forensic science's historical significance, one can't help but feel more awe for this branch of science.

The word forensic, meaning “an argumentative exercise” derives from the adjective forensic, whose earliest meaning in English is “belonging to, used in, or suitable to courts or to public discussion and debate.” The word forensic has its origin from the Latin word *forensis* which stands for a forum. In general, forensic science is employed in conjunction with any discipline that has ties to the legal system. In a word, forensic science is the application of scientific ideas and procedures to legal matters.²

The term's origins can be traced back to Roman times, when a criminal charge entailed presenting the case in front of a gathering of public figures in the forum. Both the accused and the accuser would make remarks based on their respective perspectives of the story. The case would be determined in favour of the person who made the best argument and delivered it the most effectively. This genesis is the root of the word forensics' two modern meanings: as a type of legal evidence and as a category of public presentation.

² Plourd CJ (2010) Science, the Law, and Forensic Identification. In: Forensic Dentistry, Second Edition (eds. Senn DR, Stimson PG), CRC Press, Boca Raton 1

THE EVOLUTION OF FORENSIC SCIENCE OVER TIME

Because there were no standardized forensic methods in the ancient world, offenders were able to avoid punishment. Forced confessions and witness testimony were used extensively in criminal investigations and trials. However, there are also reports of techniques in ancient literature that predict notions in forensic science that were established centuries later.³

As a component of today's criminal justice system, forensic science is still in its infancy. The value of forensic science may be traced back to some ancient cultures. The use of forensic science may be traced back to ancient Greek and Roman civilizations. Those civilizations made substantial contributions to medicine, particularly in the realm of pharmacology. Their research on the production, use, and symptoms of toxins allowed them to investigate their use in previous homicides.

The book *Xi Yuan Lu* (English as "Washing Away of Wrongs"), written in China in 1248 by Song Ci (1186–1249), a director of justice, jail, and supervision during the Song dynasty, is credited with being the earliest recorded account of utilizing medicine and entomology to settle criminal cases.⁴

³Schafer, Elizabeth D. (2008). Ancient science and forensics. In Ayn Embar-seddon; Allan D. Pass (eds.). *Forensic Science*. Salem Press. p. 40

⁴ Song, Ci, and Brian E. McKnight. *The washing away of wrongs: forensic medicine in thirteenth-century China*. Ann Arbor: Center for Chinese Studies, U of Michigan, 1981. Print. p. 3.

Song Ci discussed the rules for presenting autopsy reports in court, how to protect evidence during the examination process, and why forensic investigators must be fair to the public. He devised methods for making antiseptic and promoting the reappearance of hidden injuries to dead bodies and bones using sunlight and vinegar under a red-oil umbrella; for calculating the time of death by factoring in weather and insect activity; and for washing and inspecting the dead body to determine the cause of death. At the time, the book detailed how to tell the difference between suicide and suicide impersonation.⁵ According to one of his reports, an investigator solved the case of a person murdered with a sickle by instructing each suspect to bring their sickle to a single spot. (He discovered it was a sickle by comparing the wounds caused by various blades on an animal carcass.) The stench of blood attracted flies, which eventually congregated on a single sickle. In light of this, the sickle's owner admitted to the crime. Other examples include how to tell the difference between drowning (water in the lungs) and strangulation (broken neck cartilage), as well as evidence from inspecting bodies to establish if a death was caused by murder, suicide, or accident.

As a forerunner to the Polygraph test, methods from around the world used saliva and inspection of the mouth and tongue to establish innocence or guilt. Some suspects in ancient India were forced to put dried rice in their mouths and then spit it back out. Those accused of a crime in ancient China were given rice powder to put in their mouths. Accused people were forced to lick hot metal rods for a short time in ancient Middle Eastern cultures. These tests were supposed to have some validity because a guilty person would make less saliva

⁵ Ibid, pp. 76-82, 86-87, 95, 161



and so have a drier mouth; the accused would be declared guilty if rice stuck to their mouths in large amounts or if their tongues were severely scorched due to a lack of saliva protection.

The early times of the development of forensics had some of these methods used in order to establish certain facts in order to solve matters of justice.

THE ORIGIN OF AUTOPSY

Autopsy is the dissection and examination of a dead body's organs and structures, also known as necropsy, post-mortem, or post-mortem examination. An autopsy may be performed to determine the cause of death, to observe the effects of disease, and to figure out how disease processes evolve and work. Autopsies are performed by physicians trained in pathology, the medical specialty that deals with the study of disease through the evaluation of tissues and body fluids. The word autopsy comes from the Greek *autopsia*, which means "to see for oneself."

The history of autopsy has been likened to that of mummification. The ancient Egyptians used embalming, or treating the dead body, methods for this. The Egyptians used unique techniques to remove all moisture from the body, leaving only a dried form that would not degrade readily. It was crucial to their beliefs that the deceased body be preserved as lifelike as possible. They were so successful that we can now gaze at an Egyptian's mummified body and get a good notion of what he or she looked like in life, 3000 years ago.

Mummification was used for the majority of Egyptian history. The earliest prehistoric mummies were most likely created by chance. Dry sand and air

preserved several bodies buried in shallow trenches dug into the sand by coincidence (because Egypt receives almost little measurable rainfall). Egyptians began actively mummifying the deceased around 2600 B.C., during the Fourth and Fifth Dynasties. During the Roman Period (ca. 30 B.C.–A.D. 364), the practice lasted and evolved for far over 2,000 years. The quality of mummification varies depending on the money paid for it at any given time. Mummies from the Eighteenth through Twentieth Dynasties of the New Kingdom (ca. 1570–1075 B.C.) are the best prepared and preserved, and include those of Tutankhamen and other well-known pharaohs.

THE PROCESS OF MUMMIFICATION

It took seventy days to mummify someone. The body was treated and wrapped by special priests who functioned as embalmers. The priests required a thorough understanding of human anatomy in addition to knowing the proper rites and prayers to be done at certain stages. The initial stage in the procedure was to remove any interior components that could quickly deteriorate. Special hooked instruments were delicately inserted up through the nose to pluck out fragments of brain tissue, and the brain was removed. It was a sensitive procedure that would easily result in facial disfigurement. The organs of the abdomen and chest were subsequently removed by embalmers through a cut on the left side of the abdomen. They left just the heart in place, considering it to be the centre of a person's being and intelligence. The stomach, liver, lungs, and intestines were stored in special boxes or jars today known as canopic jars, and the remaining organs were kept separately. These were interred alongside



the mummy. Organs were treated, wrapped, and replaced within the body in subsequent mummies. Even so, the funeral ceremony continued to include unused canopic jars.

The embalmers then removed all of the body's fluids. This was accomplished by coating the body in natron, a salt with excellent drying qualities, and inserting additional natron packets into the body. Embalmers removed the inside packets and delicately rinsed the natron off the body once it had dried fully. The end effect was a dried-up yet recognizably human figure. Sunken portions of the corpse were covered in with linen and other materials, and artificial eyes were placed to make the mummy appear even more lifelike.

The wrapping process then began. Hundreds of yards of linen were required for each mummy. The priests wrapped the long strips of linen around the body with care, sometimes individually wrapping each finger and toe before covering the entire hand or foot. Amulets were placed amid the wrappings, and prayers and magical words were scribbled on some of the linen strips to protect the dead from misfortune. Between the layers of head bandages, the priests frequently placed a mask of the person's face. The form was covered with warm resin at numerous points and the wrapping resumed. Finally, the priests wrapped the final shroud in linen strips and tied it in place. The mummy was done.

During this period, the priests who were preparing the mummy were not the only ones who were active. Although tomb preparations had typically begun long before the person's death, there was now a deadline, and craftsmen, labourers, and artists had to work rapidly. There was a lot to put in the tomb

that would be useful in the hereafter. Furniture and statuettes were made, as were wall paintings of religious or everyday subjects and meal or prayer lists. These models, photographs, and lists would transform into the genuine thing in the Afterlife through a mystical procedure. The funeral arrangements were now complete.

Priests performed special religious procedures at the tomb's entrance as part of the funeral. The "Opening of the Mouth" was the most crucial portion of the ceremony. A priest used a specific tool to touch various areas of the mummies to "open" certain parts of the body to the sensations enjoyed in life and needed in the Afterlife. The deceased individual may now speak and eat by touching the gadget to their mouth. He was finally prepared to embark on his voyage to the Otherworld. The mummy was placed in his coffin (or coffins) and the entrance to the burial room was sealed.

Although some organs were removed for preservation, the early Egyptians did not study the dead human body for an explanation of disease and death. Human dissections were not permitted during the Middle Ages, and the Greeks and Indians burned their dead without investigation. The Romans, Chinese, and Muslims all had taboos regarding opening the body.

The Alexandrian physicians Herophilus and Erasistratus performed the first real dissections for the study of disease around 300 BC, but it was the Greek physician Galen of Pergamum in the late 2nd century AD who was the first to link the patient's symptoms (complaints) and signs (what can be seen and felt) with what was discovered when examining the "affected part of the deceased."



This was a significant step forward that eventually led to the autopsy and broke a long-standing barrier to medical progress.

The first officially reported autopsy took place in 44 BC. Antistius, a Roman physician, examined the murdered body of Julius Ceaser, a Roman statesman and general. The autopsy found that, despite being stabbed 23 times, his death was caused by a single wound to the chest.

Quintilian, a Roman orator and jurist, used fundamental forensics to acquit an innocent man in the first century AD. The Roman paradigm is the bedrock of today's legal and judicial systems. As a result, it's not surprising that scientific principles were used in the assessment of evidence in ancient Rome. However, with the fall of the Roman Empire in the West, forensic science applications in criminal justice remained stagnant for the following millennium.

The Renaissance rebirth of anatomy, as exemplified by Andreas Vesalius' work (*De humani corporis fabrica*, 1543) made it possible to distinguish the abnormal as such (e.g., an aneurysm) from normal anatomy. Michelangelo, too, undertook a number of dissections after Leonardo da Vinci dissected 30 bodies and discovered "abnormal anatomy." Frederick II ordered the bodies of two executed criminals to be given every two years to medical schools, one of which was at Salerno, for an *Anatomica Publica*, which every physician was required to attend.

A magistrate in Bologna is alleged to have sought the first forensic or legal autopsy, in which the death was studied to identify the presence of "fault." Antonio Benivieni, a 15th-century Florentine physician, performed 15 autopsies specifically to establish the "cause of death" and found that several of

his findings were highly associated with the deceased's earlier symptoms. The observations made in 3,000 autopsies were compiled from the literature by Théophile Bonet of Geneva (1620–89). Various observers then established a number of particular clinical and pathologic entities, paving the way for modern practice.

Around this time, numerous scientists and scholars emerged in the field of forensics and many discoveries were realised in this era.

Medical practitioners in army and academic settings began collecting information on the cause and manner of death in 16th-century Europe. *Ambroise Paré*, a French army surgeon, investigated the impact of violent death on the internal organs in great detail. *Fortunato Fidelis* and *Paolo Zacchia*, two Italian surgeons, created the groundwork for contemporary pathology by researching changes in the body's structure as a result of disease. Writings on these subjects began to appear in the late 18th century. The French physician *Francois Immanuele Fodéré* wrote *A Treatise on Forensic Medicine and Public Health*, and the German medical expert *Johann Peter Frank* wrote *The Complete System of Police Medicine*.

Criminal investigation became a more evidence-based, rational method as the Enlightenment ideas pervaded society in the 18th century, with the use of torture to obtain confessions being reduced and belief in witchcraft and other occult forces essentially ceasing to influence court rulings. Two examples of English forensic science in separate judicial cases show how logic and process were becoming more common in criminal investigations at the time. John Toms was tried and convicted in Lancaster in 1784 for shooting Edward

Culshaw. When a pistol wad (crushed paper used to lock powder and balls in the muzzle) was discovered in Culshaw's head wound, it matched perfectly with a ripped newspaper found in Toms's pocket, leading to the conviction.

A farm laborer was prosecuted and convicted of the murder of a young maidservant in Warwick in 1816. She'd drowned in a shallow pool and was covered in bruises from a vicious attack. In the damp dirt near the pool, the cops discovered footprints and a corduroy cloth impression with a patched patch. Wheat and chaff grains were also strewn about. The breeches of a farm laborer who had been nearby threshing wheat were checked and found to match the impression in the ground near the pool exactly.

With Giovanni Morgagni, the father of modern pathology, who documented what could be seen in the body with the naked eye in 1761, the autopsy came of age. He contrasted the symptoms and observations of 700 patients with the anatomical findings after analysing their bodies in his enormous work *On the Seats and Causes of Diseases as Investigated by Anatomy*. As a result, in Morgagni's practice, the study of the patient took the place of reading books and comparing commentaries.

The gross (naked eye) autopsy reached its pinnacle with Karl von Rokitansky of Vienna (1804–78). Rokitansky didn't use the microscope much and was constrained by his own humoral hypothesis. Marie F.X. Bichat (1771–1802), a French anatomist and physiologist, emphasized the importance of generalized systems and tissues in the study of disease. However, it was the German pathologist Rudolf Virchow (1821–1902) who pioneered the cellular philosophy in pathology and autopsy, arguing that alterations in cells are the

foundation of disease understanding. He cautioned against treating pathologic anatomy—the study of the structure of diseased tissue—as a standalone discipline, stating that physiologic pathology—the study of the functioning of the body in the research of disease—would be the future of pathology.

The application of all information and instruments of the specialized modern basic sciences has been expanded to include modern autopsy. The investigation has been expanded to encompass things too small to detect without an electron microscope, as well as molecular biology, to include all that can be seen as well as what is still unknown.

Autopsy and pathology in general are today used to solve court matters dealing with the establishment of the cause of death. This in the field of evidence becomes important in corroborating witness testimonies and any evidence available on court record.

ORIGIN OF FORENSIC TOXICOLOGY

Many forms of medical or legal investigations require the use of forensic toxicology. Forensic toxicology is a field that deals with a wide range of crimes, from prescription drug abuse to recreational drug use. Many of us are aware of how forensic toxicology is used by police officers and lawyers, but the history of forensic toxicology is sometimes forgotten.

The study of the harmful effects of medications and chemicals on biological systems is known as toxicology. It is regarded to be the branch of science that deals with poisons, and a poison can be described as any substance that causes

harm when supplied to a living organism, whether by accident or deliberately.⁶ Toxicology is the study of the harmful effects of drug exposure on not only the human body but also the environment and all other species that live there. Forensic toxicology, on the other hand, is the application of toxicology and other disciplines such as analytical chemistry, pharmacology, and clinical chemistry to cases and issues in which adverse effects have administrative or medicolegal implications, and where the results are likely to be used in court. It is a totally modern science that uses established and well acknowledged scientific methods and practices for both drug analysis and interpretation in biological materials. Many of the techniques it deploys are based on breakthroughs in clinical medicine and academic laboratories all over the world. The use of this knowledge of drug presence in tissues (as determined by forensic toxicology) is to suit the various legal needs. Although there is overlap between these two scientific fields, forensic pharmacology is best described as the interpretation of pharmacological effects and duration of action for the aim of a medico-legal process.

We've all come across forensic toxicology in some form or another, whether through crime investigations, television shows, or well-known court cases. However, forensic toxicology has a long and illustrious history. It has been around for a long time. Poison was used to spears for hunting animals in roughly 50 000 BCE by primitive people. Although this does not fit under the category of forensic toxicology, we can observe that humans were utilizing

⁶ Hodgson, E., Introduction To Toxicology, In A Textbook Of Modern Toxicology 3 (Third Edition, 2004), John Wiley & Sons, Inc., Hoboken, NJ, USA

poisons to kill even back then.

Carl Wilhelm Scheele, a Swedish scientist, invented a method for identifying arsenious oxide, or simple arsenic, in corpses in 1773. In 1806, German scientist Valentin Ross built on his work by discovering how to identify poison in the stomach walls of a victim.

The first person to apply this new science to the art of forensics was James Marsh. In 1832, the prosecution asked him to testify as a chemist in a murder trial. John Bodle, the defendant, was charged for poisoning his grandfather with arsenic-laced coffee. Marsh performed the usual test by combining hydrogen sulfide and hydrochloric acid with a suspected sample. While he could detect arsenic as yellow arsenic trisulfide, it had degraded by the time it was revealed to the jury, allowing the defendant to be acquitted due to reasonable doubt.

Marsh was so irritated by this that he devised a much better test. He created arsine gas by mixing an arsenic-containing sample with sulfuric acid and arsenic-free zinc. When the gas was burned, it dissolved into pure metallic arsenic, which appeared as a silvery-black deposit when applied to a cool surface. The test, properly known as the Marsh test, was so sensitive that it could identify as little as one-fiftieth of a milligram of arsenic. In 1836, he published the first description of this test in *The Edinburgh Philosophical Journal*.

The nineteenth century saw more sophisticated breakthroughs in this field of study. Mathieu Orfila was a French physician and chemist who is known as the "Father of Toxicology." He published "*Traite Des Poisons*" in 1814, which covered the symptoms of several poisons as well as the poisons used by



criminals. He examined blood samples as well as the various effects of poisons and checked for their existence in the body after death. Orfila was called in as a medical expert and testified in a number of criminal trials. This isn't too unlike to today's expert witnesses.

As the discipline of forensic toxicology grew in popularity, a lot of work was done in the nineteenth century. Since poison had become an all-too-popular form of murder, these innovations were most likely made. In 1840, the first trial based on forensic evidence took place. Orfila testified as an expert witness in this landmark case. James Marsh's accurate arsenic detection test was employed. Marsh created this four year before the trial in England. The work of Orfila and Marsh set the way for toxicology and legal cases. Law, science, and medicine were all making significant progress.

In 1851, the United Kingdom approved the Arsenic Act. Arsenic had to be coloured with indigo or soot, according to the document. This was in response to an alarming number of unintentional (or intentional) poisonings caused by its lack of colour. Sellers of arsenic were required to keep written and signed records of who they sold their wares to and what they were used for. This was done in order to reduce poisoning cases.

In 1918, the Medical Examiner's Office and Toxicology Laboratory in New York was established, bringing forensic toxicology closer to home. The father of American toxicology is Dr. Alexander Gettler. He was the laboratory's chief forensic toxicologist and was instrumental in establishing it into a world-class toxicology facility. The American Academy of Forensic Sciences was founded after WWII, and the American Board of Forensic Toxicology was founded in

1975. These advancements safeguarded citizens and improved the testing and regulation of drugs. They also made significant contributions to forensic toxicology in the United States and around the world.

The field of forensic toxicology has a long and interesting history. This fascinating field of research has aided innumerable criminal investigations, cases, and trials for hundreds of years. It brings both justice and the truth to light. Technology has widened and strengthened this scientific field in recent years, making it even more beneficial to the globe. For hundreds of years to come, forensic toxicology will be vital and relevant.

THE ORIGIN OF BALLISTICS

Ballistics is the study of projectile flight paths. When forensic ballistics or ballistic fingerprinting (also known as forensic firearm examination) is utilized in criminal investigations, it aids in the reconstruction of a crime scene involving a firearm. It also allows for the tracking of the weapon used, which leads to the identification of the culprit (s). Bullets, gunpowder remnants, shell casings, guns, and other evidence obtained from the crime scene are heavily used in forensic ballistics.

Forensic ballistic experts are skilled at analysing such data to derive firm conclusions about the weapon used, the distance, velocity, and angle of fire, and, eventually, the shooter himself. The matching of recovered bullets and their casings to the firearms from which they were discharged has become synonymous with forensic ballistics in crime scene investigations. While modern-day crime drama series may make the use of such techniques appear to

be quite modern, the fact remains that such ballistic work has its origins in the past.

Gunsmiths handcrafted barrels and bullet molds before mass production of weapons began. As a result, each firearm's exclusivity was unavoidable. This meant that the bullets fired always left distinctive impressions that were specific to a particular firearm. Thus began the first instances of a bullet being carefully examined in order to trace it back to the gun that fired it. This set the groundwork for forensic fingerprinting, which is the forensic study of firearms and other evidence (bullets, cartridges, etc.) retrieved from crime scenes in order to link them to suspects or specific weapons used in a crime.

The first reported case of forensic firearm examination occurred in 1835. That's when ballistic fingerprinting was used by Henry Goddard to match a bullet recovered from the victim to the real criminal. On closer inspection, he discovered an imperfection on the bullet's surface that did not appear to be caused by the barrel or an impact. It appeared to be a flaw that occurred during the production process. He reasoned that since the shooter would have produced the bullet himself, recovering the bullet mold would be a simple way to prove the gunman's identity. When the mold found in the suspect's home matched the marks on the bullet, he was able to pinpoint the shooter with pinpoint accuracy. This was key evidence in convicting the gunman, even though he subsequently confessed to the crime.

Regina v Richardson, a case from 1860, is another example of the early application of firearm identification. A newspaper wadding was the main piece of evidence in this case. Such wadding was employed to provide a seal between

the bullet and the gunpowder prior to the invention of cartridges. The wadding found in the victim's wound matched the wadding found in the two-barreled muzzle-loading pistol recovered from the crime scene. Furthermore, a wadding located at the suspect's residence was discovered to be made of the same substance (London Time's newspaper) as the waddings previously collected. This contributed to his conviction by confirming that he was the gunman.

As mass production of weapons and ammunition increased, the rifling process became more uniform. As a result, while a forensic expert could match the rifling markings on a bullet recovered from a crime scene to those on the rifle's barrel, matching a bullet to a specific firearm built by a certain manufacturer through mere observation became increasingly difficult. As the saying goes, "necessity is the mother of ingenuity!" As a result, the magnified observation of bullets became possible.

In 1902, Oliver Wendell Holmes, who subsequently became a justice of the United States Supreme Court, is reported to have examined a test bullet fired into cotton wool with a magnifying glass to compare its striations with those found on the bullet retrieved from the victim during an autopsy. Professor Balthazard afterwards photographed the circumferences of the bullet found at the crime site in Paris (1912). He then magnified the images to compare the markings to those found on the bullet he had tested-fired from the suspect's weapon.

Magnification became a necessary aspect of firearm inspections over time.

Even though microscopes were available at the time, comparing two bullets at the same time was difficult. Forensic examiners had to keep the mental image of the other bullet for comparison while analyzing one bullet under the

microscope. This constituted a clear threat to the investigations' authenticity and credibility.

In reality, a serious mistake in ballistic fingerprinting nearly contributed to the conviction of Charles F. Stielow, an innocent man, in the United States in 1915. He was found guilty and sentenced to death for shooting his boss and his housekeeper with a 0.22 caliber pistol. When investigator Charles E. Waite reevaluated the evidence with Dr. Max Poser, a microscopy specialist, he concluded that the bullets recovered from the crime scene could not have been shot from Stielow's gun. After that, Stielow was acquitted and released.

Waite began recording the manufacturing data on weapons and ammo because he was embarrassed and concerned about the possibility of future errors. When he realized that the bulk of firearms were imported at the time, he made sure to cover foreign suppliers as well. Waite created the Bureau of Forensic Ballistics in New York City with the help of physicist John Fisher, Major Calvin Goddard, and chemist Philip Gravelle. The comparison microscope (two microscopes joined by an optical bridge) was eventually invented by Philip Gravelle to solve the challenges of simultaneous comparison.

The investigation of the Saint Valentine's Day Massacre in 1929 was the first significant application of this microscope. He was able to identify the specific weapons used by analysing the bullets and cartridge shells discovered from the scene — a 12-gauge shotgun and two Thompson submachine guns. He was also led to the culprit by comparing the evidence found to the gun he had seized from his residence. Goddard was the first firearm identification professional trained by the FBI laboratory, which opened in 1932.

THE HISTORY OF ANTHROPOMETRY IN LAW

The systematic measurement of the physical attributes of the human body is known as anthropometry. Eye height, or the distance from the floor to a person's eyes, can be measured either sitting or standing. Elbow height, hip breadth, overall stature, knuckle height, and popliteal height, or the distance from the floor to the back of the knee, are among the other measurements.

Alphonse Bertillon, a French police officer, was the first to apply the anthropological technique of anthropometry to law enforcement, resulting in the creation of a physical-based identification system. Prior to then, criminals could only be identified by their name or an image. He began working on constructing a dependable system of anthropometrics for human classification after becoming dissatisfied with the ad hoc methods used to identify captured criminals in France in the 1870s.

The department of "Judicial Identity" was established in 1893, and Bertillon was instructed to apply his methods to the national archive known as the *sommiers judiciaires*, which included the descriptions and criminal records of all convicted criminals. Bertillon became increasingly involved in the creation of a network system connecting the capital to the rest of the country. The big cities quickly followed suit, establishing their own identification offices that fed into a single database. Bertillon also assisted detectives in the use of mobile identification tools such as stamp-size mug shots, criminal categories albums, descriptive notes, and so on.

The Dreyfus Affair put Alphonse Bertillon's career in jeopardy in the late nineteenth century. He testified as an expert witness in the case, providing the crucial handwriting analysis of the document allegedly demonstrating the defendant's betrayal. He concluded that Dreyfus would have forged his own signature in order to deceive the court. Bertillon was fired from his position as head of the handwriting analysis laboratory after being accused of aiding the government's lies. Despite these advances, Alphonse Bertillon's work continues to have a huge impact. He widely popularized his approaches among French and international police through innovative courses in anthropometric description and recognition (1895), physical description (1902), and technical police investigation (1912).

Bertillon also invented forensic document inspection, the use of galvanoplastic substances to retain footprints, ballistics, and the dynamometer, which is used to measure the degree of force used in breaking and entering. "His other innovations, including as the mug shot and the systematization of crime-scene photographs, remain in place to this day," says the author, despite the fact that his primary methods were shortly to be overtaken by fingerprinting.

THE ORIGIN OF FINGERPRINTS

The friction ridges of a human finger leave an impression on a fingerprint. Partially recovering fingerprints from a crime scene is an essential forensic technique. Fingerprints on surfaces such as glass and metal are caused by moisture and grease on a finger. Ink or other substances transferred from the peaks of friction ridges on the skin to a flat surface such as paper can be used to

make deliberate impressions of whole fingerprints. Fingerprint cards often record sections of the lower joint areas of the fingers, though fingerprint records typically contain impressions from the pad on the last joint of the fingers and thumbs.

Human fingerprints are highly detailed, nearly unique, impossible to modify, and long-lasting, making them ideal as long-term markers of human identification. They may be used by police or other authorities to identify people who desire to remain anonymous, as well as people who are incompetent or deceased and thus unable to identify themselves, such as in the aftermath of a natural disaster.

Sir William Herschel was one of the first to argue for the use of fingerprints in criminal suspect identification. In 1858, while working for the Indian Civil Service, he began using thumbprints on documents as a security mechanism to prevent signature repudiation, which was prevalent at the time.

Herschel initiated the use of fingerprints on contracts and deeds in 1877 at Hooghly (near Kolkata), and he registered government pensioners' fingerprints to prevent relatives from collecting money after a pensioner's death.

Dr. Henry Faulds, a Scottish surgeon working at a Tokyo hospital, wrote the first paper on the issue in the scientific magazine *Nature* in 1880, exploring the utility of fingerprints for identification and proposed a way for recording them using printing ink. He was the first to classify them, as well as the first to recognize fingerprints left on a bottle. When he returned to the United Kingdom in 1886, he pitched the idea to the Metropolitan Police in London, but it was rejected at the time.

Faulds wrote to Charles Darwin with a description of his method, but because Darwin was too old and ill to work on it, he passed the knowledge on to his cousin Francis Galton, an anthropologist. After being inspired to study fingerprints for ten years, Galton developed a precise statistical model of fingerprint analysis and identification in his book *Finger Prints*, which stimulated its usage in forensic science. He estimated that the chances of a "false positive" (two people with the identical fingerprints) were around one in 64 billion.

Juan Vucetich, an Argentine chief police officer, invented the first technique of keeping track of people's fingerprints. Vucetich established the world's first fingerprint bureau in 1892 after analysing Galton's pattern kinds. Francisca Rojas of Necochea was found with neck injuries in a residence in the same year, and her two sons were found dead with their throats slashed. Rojas accused a neighbour, but the neighbour refused to admit to the crimes despite rigorous torture. Inspector Alvarez, a Vucetich colleague, arrived at the site and discovered a bloody thumb mark on a door. It was discovered to be identical to Rojas' right thumb when it was compared to her prints. She then admitted to the assassination of her two sons.

After the Council of the Governor General authorized a committee recommendation that fingerprints should be used for the classification of criminal records, a Fingerprint Bureau was formed in Calcutta (Kolkata), India, in 1897. Azizul Haque and Hem Chandra Bose worked in the Calcutta Anthropometric Bureau before it became the Fingerprint Bureau. Haque and Bose were Indian fingerprint experts who are credited with developing the first

fingerprint classification system, which was later named after their supervisor, Sir Edward Richard Henry. When the first United Kingdom Fingerprint Bureau was established in Scotland Yard, the Metropolitan Police headquarters in London, in 1901, the Henry Classification System, co-developed by Haque and Bose, was approved in England and Wales. Following that, Sir Edward Richard Henry improved his dactyloscopy.

Dr. Henry P. DeForrest used fingerprinting in the New York Civil Service in 1902, and New York City Police Department Deputy Commissioner Joseph A. Faurot, an expert in the Bertillon system and a fingerprint advocate at Police Headquarters, introduced criminal fingerprinting to the United States in December 1905.

ORIGINS OF THE USE OF DNA

DNA is the abbreviation for Deoxyribo Nucleic Acid. It is a cell's genetic material. DNA makes up the chromosomes inside the nucleus of the cell. It's exceedingly fine and tightly coiled, but a single cell can contain up to a meter of it. DNA is really a code. It's broken down into sections. These are genes, which contain all of the instructions for constructing our body, or the body of any living organism. So, there's a gene that signals the body to have brown hair, blue eyes, or an iny or outy belly button, and so on. As a result, our genes determine how we are built and how our bodies appear.

In a laboratory in the Department of Genetics at the University of Leicester, England, Sir Alec Jeffreys, a British geneticist, discovered the technology of DNA testing to determine a genetic "fingerprint" in 1984. After seeing at the X-

ray film image of a DNA experiment that unexpectedly showed both similarities and variations between the DNA of different members of his technician's family, Jeffreys claims he had a "eureka moment" in his lab. He realized the potential scope of DNA fingerprinting, which uses variations in the genetic code to identify individuals, after about half an hour.

Jeffreys' DNA technology was initially used in a contentious immigration case in 1985, when he was asked to assist in confirming the family identity of a British youngster whose family was originally from Ghana. A Ghanaian family immigrated to the United Kingdom and became citizens. However, one of the sons returned to Ghana and was denied entry to the United Kingdom due to a false passport. Jeffreys was approached by the family's lawyer, who asked if he could confirm that the boy was the mother's son and not her nephew. The mother, the son whose identity was disputed, and the mother's three undisputed children all had DNA samples taken. The relationship between the mother and the son in question was confirmed by DNA sequences. Furthermore, the tests revealed that all four children were born to the same father. Sir Jeffreys stated he could see the mother's relief when the results were announced.

In 1986, DNA fingerprinting was utilized for the first time in a police forensic test. In the years 1983 and 1986, two teens were raped and murdered in Narborough, Leicestershire. Despite the fact that the attacks happened three years apart, the similarities prompted the authorities to think that the perpetrator was the same person. Richard Buckland, a suspect in custody, admitted to the most recent murder but not the first. Jeffreys was asked to

perform DNA profiling on a blood sample taken from the suspect, as well as tissue samples and sperm from the two victims.

The DNA profiling revealed that both victims' sperm were identical, showing that both murders were perpetrated by the same perpetrator. The findings, on the other hand, proved that Richard Buckland was not the murderer. His confession had been obviously untrue. He was freed and became the first suspect to have DNA evidence clear him of a crime.

The killer's DNA profile was then matched by a large-scale manhunt to discover the individual whose DNA profile matched that of the killer's sperm. All adult men in the neighbourhood were requested to provide blood or saliva samples for testing. More than 5000 samples were gathered, and DNA profiling was performed on the 10% of men who shared the killer's blood type, but no match was identified. The fact that this innovative and advanced test failed to identify the killer disappointed both the police and the public.

A woman reported overhearing a man claim to have provided blood on behalf of a co-worker, Colin Pitchfork, six months after the initial investigation. Pitchfork was captured and his blood examined, yielding the long-awaited DNA match, and Pitchfork was found guilty of both murders.

DNA databases were created as a result of this case. There are databases for the United States (FBI) and other countries, as well as European countries (ENFSI: European Network of Forensic Science Institutes). These searchable databases are used to compare DNA profiles from crime scenes to those previously stored in a database.



Conclusion

Documenting forensics scenes has gotten more efficient over the last decade. To obtain 3D point clouds of accidents or crime scenes, forensic experts have begun to use laser scanners, drones, and photogrammetry. The data collecting period for reconstructing an accident scene on a highway using drones is only 10–20 minutes, and it can be done without slowing down traffic. The results are not only precise in centimetres for measurement in court, but they are also simple to digitally maintain in the long run. Much of forensic science's future in the twenty-first century is up for debate.

L A W S A N D P R I N C I P L E S O F F O R E N S I C S C I E N C E

The laws and principles of all the natural sciences are the bases of forensic science. In addition, it has developed its own principles. The laws and principles of the natural sciences have served as the foundation for forensic science. In reality, the application of all sciences to evaluate evidence in order to solve crimes has aided in the development of various forensic laws and principles.

There are 7 fundamental principles of forensics, including;

1. Law of Individuality
2. Law of Progressive change
3. Principle of Comparison
4. Principle of Analysis
5. Locard's principle of Exchange

6. Law of Probability
7. Law of Circumstantial facts.

These seven forensic science principles are critical in crime scene investigations because they help to link a suspect to the crime scene, as well as a victim to the crime scene and suspect, in order to build a strong case against an accused person and secure a conviction.

1. Law of Individuality

This law states that, “Every object whether natural or man-made has a unique quality or characteristic in it which is not duplicated in any other object.”

The law of individuality has been shown in a variety of domains, the most common of which being fingerprinting. Despite the fact that millions and billions of fingerprints have been investigated, not a single one has matched with another, whether they are twins or two fingers from the same person.

Any two objects, such as grains of sand, salt, seeds, twins, or man-made objects such as currency notes, coins, laptops, suits, typewriters, and so on, may appear similar, but they always have a distinguishing feature.

2. Law of Progressive Change

This law states that, “Everything changes with the passage of time. “

Simply put, nothing is permanent, and the pace of change varies depending on the object. Because of the changes that occur in the crime scene and criminal with the passage of time, this law has a substantial impact on crime scene investigations. It's possible that the criminal, evidence, and objects involved will become unrecognizable.

A change in weather, the presence of animals/humans, and other factors can

quickly transform the crime scene if it is not secured in a timely manner. If not secured in a timely manner, a road collision on a busy highway, for example, may become unrecognizable or lose all vital evidence.

Bullet fragments may rust, shoes may develop wear and tear marks, wooden goods may rot due to termite infestation, knives may create new designs, and so on. As a result, in all aspects of criminal investigations, prompt action is essential.

3. Principle of Comparison

This law states that, “Only the likes can be compared. “

It emphasizes the importance of providing similar samples and specimens to compare with the questioned evidences. The expert in a murder case believes the victim was killed by stabbing with a sharp piece of rod. There will be no need to send a knife for comparison. It will be pointless to send a handgun for comparison if a bullet recovered from the body is discharged from the shotgun.

4. Principle of Analysis

This principle states that, “There can be no better analysis than the sample analysed.” This principle emphasizes the importance of proper evidence sampling and packing to prevent tampering and destruction, as well as effective analysis and outcomes. Incorrect sampling may cause the investigator to be misled.

If for example, in a rape case, the investigating officer seized the victim's clothes, which were stained with semen and blood. When the clothing were sent to be examined for sperm and blood group determination The semen was of the AB blood group, whereas the victim is of the A blood group and the

accused is of the B blood group. Why would the outcomes be incorrect?

5. Locard's Principle of Exchange

This principle states that, "Whenever two entities come in contact with each other, they exchange the traces between them." This theory is known as Locard's principle since it was developed by a French physicist named Edmond Locard.

According to Locard, when the victim and the surrounding area are in contact with a criminal or murder weapon or with any one of his objects, they leave traces in it, whereas traces are also found from those places or people with whom they are in contact. The criminal may be linked to the crime scene and the victim if these traces are identified by the expert and tracked to its source.

In virtually every case of contact such as fingerprints, footmarks, tyre marks, bullet residue, hair sample etc., this principle is demonstrated.

6. Law of Probability

This law states that, "All identifications definite or indefinite, made consciously or unconsciously are on the basis of probability."

Most often the term probability is misunderstood. The chances of a particular event occurring in a certain way are determined from the total number that an event can or cannot occur with equal capacity.

An unidentified woman, for example, is discovered slain in a farm. That woman's body had a scar on the forehead, a healed foot fracture, and a big birthmark on her left arm when she died. A woman with comparable features has also been reported missing. Is it possible that the unidentified body is that of the missing woman? The chances of that corpse being that of another woman

are one in a million, and the identity of that unknown corpse is determined.

7. Law of Circumstantial Facts

According to this law, “Facts do not lie, men can and do.”

Facts can't be wrong, can't lie, and can't be completely missing. As a result, the significance of circumstantial circumstances is beneficial to oral evidence.

If a person who is in the military forces is known to work until 10 p.m. and then resume work at 9 a.m. if this person sneaks out of the unit at night, kills someone, and then sneaks back in to report for duty on time. He can show his presence in the unit at that time using circumstantial evidence and avoid penalty. I will try to discuss this in depth below following each principle.

LAW OF INDIVIDUALITY

Every object, natural or man-made, has an individuality which is not duplicated in any other object. This principle, at first sight appears to be contrary to common beliefs and observations. The grains of sand or common salt, seeds of plants or twins look exactly alike. Likewise, man-made objects: coins of the same denomination made in the same mint, currency notes printed with the same printing blocks one after the other (excluding serial number) and typewriters of the same make, model and batch appear to be indistinguishable. Yet the individuality is always there. It is due to small flaws in the materials, in the arrangement of the crystals, imperfect stamping or due to inclusions of some extraneous matter.

The individuality has been verified in certain fields. The most extensive work has been carried out in finger prints. Millions of prints have been checked but

no two fingerprints, even from two fingers of the same person have ever been found to be identical. The law of individuality is of fundamental importance in forensic science. Anything and everything involved in a crime, has an individuality. If the same is established, it connects the crime and the criminal.

PRINCIPLE OF EXCHANGE

‘Contract exchanges traces’ is the principle of exchange. It was first enunciated by the French scientist, Edmond Locard. According to the principal, when a criminal or his instruments of crime come in contact with the victim or the objects surrounding him, they leave traces. Likewise, the criminal or his instruments pick up traces from the same contact. Thus, a mutual exchange of traces like takes place between the criminal, the victim and the objects involved in the crime. If these traces are identified to the original source, viz., the criminal or his instrument (or vice versa), they establish the contact and pin the crime on to the criminal. The principal of exchange is aptly demonstrated in hit and run cases and in offences against person.

The basic requirement of the principle is the correct answer to the question ‘What are the places or objects with which the criminal or his tools actually came in contact?’ If the investigating officer is able to establish the points of contact, he is likely to reap a rich harvest of physical clues: If a criminal enters the premises through a ventilator, he leaves his foot prints in dust on the sill, If he breaks a window or a door, the jimmy leaves its marks on the wooden frame. The burglar, who opens a safe by an explosive, leaves the area around and the clothes (including shoes) covered with insulating material as well as



some exploded and unexploded explosive materials.

The criminal is likely to leave and carry minute traces only. It is seldom that he dares or neglects to leave or carry gross objects or traces. On a thorough search, the inconspicuous traces will always be found in all types of crimes. The minute traces connect the crime and the criminal as effectively as the gross objects or traces.

L A W O F P R O G R E S S I V E C H A N G E

‘Everything changes with the passage of time’ The rate of change varies tremendously with different objects. Its impact on forensic science is immense. The criminal undergoes rapid changes. If he is not apprehended in time, he becomes unrecognizable except perhaps through his fingerprints, bone fractures or other characteristics of permanent (comparatively speaking) nature which are not always available. The scene of occurrence undergoes rapid changes. The weather, the vegetable growth, and the living beings (especially human-beings) make extensive changes in comparatively short periods. Longer the delay in examining the scene, greater will be the changes. After some time, the scene may become unrecognizable. The objects involved in crime change gradually, the firearm barrels loosen, metal objects rust, the shoes suffer additional wear and tear and the tools acquire new surface patterns. In course of time the objects may lose all practical identity vis-à-vis a particular crime, the principle, therefore, demands prompt action in all aspects of criminal investigation.

PRINCIPLE OF COMPARISON

Only the like can be compared is the principle of comparison. It emphasizes the necessity of providing like samples and specimens for comparison with the questioned items: In a murder case, a bullet is recovered from the deceased. The expert opines that the bullet has been fired from a firearm firing high velocity projectiles like a service rifle. It is futile to send shotguns, pistols or revolvers as the possible suspect firearm. A bunch of hair is recovered from the hands of a deceased. The expert opines that the hair belongs to a Negroid person. Hair from persons of white races for comparison will not be of any use. The questioned writing is found to have been writing with a ball pen. To send fountain pen as a likely instrument of writing is futile. Once handwriting available on a photograph allegedly written on a wall was compared with the specimen written on a paper. It did not give worthwhile results.

A second set of specimens was obtained by writing on the same wall, at the same height and with the same instrument and then photographed. It allowed comparison. (CH)

PRINCIPLE OF ANALYSIS

The analysis can be no better than the sample analysed. Improper sampling and contamination render the best analysis useless. The principle emphasizes the necessity of correct sampling and correct packing for effective use of experts. A criminal while running away from the scene of occurrence brushes against a painted surface. Some powdered particles of paint get deposited upon his clothes. The investigating officer scraps a few grams of paint from the same

surface with a pen-knife and sends it as control sample. The result of the analysis shows that the two paints do not match. Why? A small amount of dust is recovered from a small sticky patch of the shoe of a culprit. The investigating officer collects about two kilograms of soil from the scene packs it in tin and sends it as a control sample. The results of comparison are inconclusive. Why? In a rape case, the investigating officer collects the clothes of the victim. The clothes carry both blood and semen stains. The investigating officer dries the clothes and packs them together and sends them through a railway parcel. He wants to know if the clothes carry semen stains, and if so, to which blood group does the secretor belong?

The expert establishes the existence of semen but fails to give its blood grouping; because he finds powdered blood sticking to semen stain.

FACTS DO NOT LIE

‘Facts do not lie, men can and do’, hence the importance of circumstantial evidence vis-à-vis oral evidence. The oral testimony depends upon the power of observation, assimilation and reproduction of the witness. It is modified by the power of observation, assimilation and reproduction of the witness. It is modified by auto suggestion, external influence, suggestions, descriptions and opinions of others and rationality. Oral evidence, therefore, is coloured whereas factual evidence is free from these infirmities.

But ‘facts’ can also be created:

1. A person is killed in an accident firing. The relatives want to implicate their

opponents. They procure an unlicensed firearm, fire a cartridge, place at the scene and plant the firaram on the opponent.

The police recover the shell and the firearm. The shell is married to the firearm.

The police prosecute the person

2. A person is in the armed forces. He is seen carrying out duty upto 1 A.M. in the unit. He slips through the guarded premises, goes about a hundred miles, and commits a murder, returns to his unit, enters into the guarded premises secretly and is present on his duty at 7-30 A.M. By circumstantial evidence he proves his presence in the unit throughout the night.

3. A threatens B with death. The next day B is found murdered. B had no other enemies except A. Police suspects A as the murderer. He is not found anywhere. He is declared a proclaimed offender. Soon after 'A' appears before a magistrate and says he had gone on a pilgrimage. But checking at the allegedly visited places, his visits to the places are not established. He is arrested and prosecuted. In defence, he produces the jail record. He was behind the bars at the relevant time. He escapes sentence.

LAW OF PROBABILITY

All identifications, definite or indefinite, are made, consciously or unconsciously, on the basis of probability.

'Probability' is mostly misunderstood. If we say that according to probability a particular fingerprint has come from the given source, the defence counsels will make most of the word and plead that it is not a definite opinion. Consequently, it is not customary to talk of 'proability' or 'probability figures' in counts.

Probability is the mathematical concept. It determines the chances of occurrence of a particular event in a particular way out of a number of ways in which the event can take place or fail to take place with equal facility. If P represents probability N1 the number of ways in which the event can successfully occur (with equal facility) and N2 the number of ways in which it can fail (with equal facility), the probability of success is given by the formula:
$$P = \frac{N1}{N1 + N2}$$

We have neglected other factors (sex, age and dress) and even without these additional factors, the identity of the deceased is established beyond a 'reasonable doubt'.

TOOLS AND TECHNIQUES

The tools and techniques of forensic science are oriented to meet the following exacting demands in an analysis:

1. Sensitivity
2. Specificity
3. Rapidity

The instruments and techniques should be highly sensitive because the quantities of materials involved are extremely small, often in micro, sub micro or microscopic ranges. For example, a few milligrams of certain poisons are sufficient to kill a person. The quantity is distributed in whole body. Paints, soils, dusts, inks and body fluids are often met with in micro quantities.

The number of cases requiring evaluation of clues is increasing everyday. The techniques and instruments should, therefore, be rapid. In classical examination

of viscera and organs each item is subjected to lengthy process of extraction, purification, identification and estimation. The results are checked and cross checked for mistakes. Modern techniques may eliminate most of these steps. The tools and techniques currently used in modern forensic science laboratories belong to both classical and modern categories.

They are as follows:- Ø Measurements Ø Microscopy Ø Photography Ø Invisible rays Ø Chromatography Ø Electrophoresis Ø Spectrography Ø Laser Techniques Ø Mass Spectrometry Ø X- Ray diffraction analysis.

CHAPTER TWO



PRINCIPLES OF FORENSIC PRACTICE

Different countries have different legal systems, which broadly divide into two areas – criminal and civil. The systems have generally evolved over many years or centuries and are influenced by a wide variety of factors including culture, religion and politics. By and large, the rules have been established over many hundreds of years and are generally accepted because they are for the mutual benefit of the population – they are the framework that prevents anarchy. Although there are some common rules (for example concerning murder) that are to be found in every country, there are also considerable variations from country to country in many of the other codes or rules. The laws of a country are usually established by an elected political institution, the population accepts them and they are enforced by the imposition of penalties on those who are found guilty of breaking them. Members of medical, healthcare and scientific professions are bound by the same general laws as the population as a whole, but they may also be bound by additional laws specific to their area of practice. The training, qualification and registration of doctors, scientists and related professions is of great relevance at the current time, in the light of the recognized need to ensure that evidence, both medical and scientific, that is placed before the court, is established and recognized. Fraudulent professional and ‘hired guns’ risk undermining their own professions, in addition to

causing miscarriages of justice where the innocent may be convicted and the guilty acquitted. It is sometime difficult for medical and scientific professionals to realize that their evidence is only part of a body of evidence, and that unlike in the fictional media, the solving of crimes is generally the result of meticulous painstaking and often tedious effort as part of a multi-professional team. The great diversity of the legal systems around the world poses a number of problems to the author when giving details of the law in a book such as this. Laws on the same aspect commonly differ widely from country to country, and some medical procedures (e.g. abortion) that are routine practice (subject to appropriate legal controls) in some countries are considered to be a crime in others. Within the United Kingdom, England and Wales has its own legal system, and Scotland and Northern Ireland enjoy their own legal traditions which, although distinct from that of England and Wales, share many traditions. There are also smaller jurisdictions with their own individual variations in the Isle of Man and the Channel Isles. Overarching this is European legislation and with it the possibility of final appeals to the European Court. Other bodies (e.g. the International Criminal Court) may also influence regional issues.

This book will utilize the England and Wales legal system for most examples, making reference to other legal systems when relevant. However, it is crucial that any individual working in, or exposed to, forensic matters is aware of those relevant laws, statutes, codes and regulations that not only apply generally but also specifically to their own area of practice.



LEGAL SYSTEMS

Laws are rules that govern orderly behaviour in a collective society and the system referred to as ‘the Law’ is an expression of the formal institutionalization of the promulgation, adjudication and enforcement of rules. There are many national variations but the basic pattern is very similar. The exact structure is frequently developed from and thus determined by the political system, culture and religious attitudes of the country in question. In England and Wales, the principal sources of these laws are Parliament and the decisions of judges in courts of law. Most countries have two main legal systems: criminal courts and civil courts. The first deals predominantly with disputes between the State and individual, the second with disputes between individuals. Most jurisdictions may also have a range of other legal bodies that are part of these systems or part of the overall justice system (e.g. employment tribunals, asylum tribunals, mental health review tribunals and other specialist dispute panels) and such bodies may deal with conflicts that arise between citizens and administrative bodies, or make judgements in other disputes. All such courts, tribunals or bodies may at some stage require input from medical and scientific professionals. In England and Wales, decisions made by judges in the courts have evolved over time and this body of decisions is referred to as ‘common law’ or ‘case law’. The ‘doctrine of precedent’ ensures that principles determined in one court will normally be binding on judges in inferior courts. The Supreme Court of the United Kingdom is the highest court in all matters under England and Wales law, Northern Irish law and Scottish civil law. It is

the court of last resort and highest appeal court in the United Kingdom; however, the High Court of Justiciary remains the supreme court for criminal cases in Scotland. The Supreme Court was established by the Constitutional Reform Act 2005 and started work on 1 October 2009. It assumed the judicial functions of the House of Lords, which were previously undertaken by the Lords of Appeal in Ordinary (commonly called Law Lords). Along with the concept of Parliamentary Sovereignty is that the judiciary are independent of state control, although the courts will still be bound by statutory law. This separation is one that is frequently tested.

CRIMINAL LAW

Criminal law deals with relationships between the state and the individual and as such is probably the area in which forensic medical expertise is most commonly required. Criminal trials involve offences that are ‘against public interest’; these include offences against the person (e.g. murder, assault, grievous bodily harm, rape), property (e.g. burglary, theft, robbery), and public safety and security of the state (terrorism). In these matters the state acts as the voice or the agent of the people. In continental Europe, a form of law derived from the Napoleonic era applies. Napoleonic law is an ‘inquisitorial system’ and both the prosecution and the defence have to make their cases to the court, which then chooses which is the more credible. Evidence is often taken in written form as depositions, sometimes referred to as ‘documentary evidence’. The Anglo-Saxon model applies in England and Wales and in many of the countries that it has influenced in the past. This system is termed the

‘adversarial system’. If an act is considered of sufficient importance or gravity, the state ‘prosecutes’ the individual. Prosecutions for crime in England and Wales are made by the Crown Prosecution Service (CPS), who assess the evidence provided to them by the police. The CPS will make a determination as to whether to proceed with the case and, in general, the following principles are taken into account: prosecutors must be satisfied that there is sufficient evidence to provide a realistic prospect of conviction against each suspect on each charge; they must consider what the defence case may be, and how it is likely to affect the prospects of conviction; a case which does not pass the ‘evidential stage’ must not proceed, no matter how serious or sensitive it may be. Sir Hartley Shawcross in 1951, who was then Attorney General, stated: ‘...[this] has never been the rule in this country – I hope it never will be – that suspected criminal offences must automatically be the subject of prosecution’. He added that there should be a prosecution: ‘wherever it appears that the offence or the circumstances of its commission is or are of such a character that a prosecution in respect thereof is required in the public interest’ (House of Commons Debates). This approach has been endorsed by Attorneys General ever since. Thus, even when there is sufficient evidence to justify a prosecution or to offer an out-of-court disposal, prosecutors must go on to consider whether a prosecution is required in the public interest. The prosecutor must be sure that there are public interest factors tending against prosecution that outweigh those tending in favour, or else the prosecutor is satisfied that the public interest may be properly served, in the first instance, by offering the offender the opportunity to have the matter dealt with by an out-of-court disposal. The more

serious the offence or the offender's record of criminal behaviour, the more likely it is that a prosecution will be required in the public interest. In a criminal trial it is for the prosecution to prove their case to the jury or the magistrates 'beyond reasonable doubt'. If that level cannot be achieved, then the prosecution fails and the individual is acquitted. If the level is achieved, then the individual is convicted and a punitive sentence is applied. The defence does not have to prove innocence because any individual is presumed innocent until found guilty. Defence lawyers aim to identify inconsistencies and inaccuracies or weaknesses of the prosecution case and can also present their own evidence. The penalties that can be imposed in the criminal system commonly include financial (fines) and loss of liberty (imprisonment) and community-based sentences. Some countries allow for corporal punishment (beatings), mutilation (amputation of parts of the body) and capital punishment (execution). In England and Wales the lowest tier of court (in both civil and criminal cases) is the Magistrates' Court. 'Lay' magistrates sit in the majority of these courts advised by a legally qualified justice's clerk. In some of these courts a district judge will sit alone. Most criminal cases appear in magistrates' courts. The Crown Court sits in a number of centres throughout England and Wales and is the court that deals with more serious offences, and appeals from magistrates' courts. Cases are heard before a judge and a jury of 12 people. Appeals from the Crown Court are made to the Criminal Division of the Court of Appeal. Special courts are utilised for those under 18 years of age.



CIVIL LAW

Civil law is concerned with the resolution of disputes between individuals. The aggrieved party undertakes the legal action. Most remedies are financial. All kinds of dispute may be encountered, including those of alleged negligence, contractual failure, debt, and libel or slander. The civil courts can be viewed as a mechanism set up by the state that allows for the fair resolution of disputes in a structured way. The standard of proof in the civil setting is lower than that in the criminal setting. In civil proceedings, the standard of proof is proof on the balance of probabilities a fact will be established if it is more likely than not to have happened. Recently Lord Richards noted in a decision of the Court of Appeal in *Re (N) v Mental Health Review Tribunal* (2006) QB 468 that English law recognizes only one single standard for the civil standard but went on to explain that the standard was flexible in its application:

‘Although there is a single standard of proof on the balance of probabilities, it is flexible in its application. In particular, the more serious the allegation or the more serious the consequences if the allegation is proved, the stronger must be the evidence before the court will find the allegation proved on the balance of probabilities. Thus the flexibility of the standard lies not in any adjustment to the degree of probability required for an allegation to be proved (such that a more serious allegation has to be proved to a higher degree of probability), but in the strength or quality of the evidence that will in practice be required for an allegation to be proved on the balance of probabilities.’

If the standard of proof is met, the penalty that can be imposed by these courts is designed to restore the position of the successful claimant to that which they had before the event, and is generally financial compensation (damages). In certain circumstances there may be a punitive element to the judgment. The Magistrates' Court is used for some cases, but the majority of civil disputes are dealt within the County Court in the presence of a circuit judge. The High Court has unlimited jurisdiction in civil cases and has three divisions:

- 1 Chancery – specializing in matters such as company law;
- 2 Family – specializing in matrimonial issues and child issues; and
- 3 Queen's Bench – dealing with general issues

In both civil and criminal trials, the person against whom the action is being taken is called the defendant; the accuser in criminal trials is the state and in civil trials it is the plaintiff.

PROFESSIONAL WITNESS

A professional witness is one who gives factual evidence. This role is equivalent to a simple witness of an event, but occurs when the doctor is providing factual medical evidence. For example, a casualty doctor may confirm that a leg was broken or that a laceration was present and may report on the treatment given. A primary care physician may confirm that an individual has been diagnosed as having epilepsy or angina. No comment or opinion is generally given and any report or statement deals solely with the relevant medical findings.



EXPERT WITNESS

An expert witness is one who expresses an opinion about medical facts. An expert will form an opinion, for instance about the cause of the fractured leg or the laceration. An expert will express an opinion about the cause of the epilepsy or the ability of an individual with angina to drive a passenger service vehicle. Before forming an opinion, an expert witness will ensure that the relevant facts about a case are made available to them and they may also wish to examine the patient. In the United Kingdom the General Medical Council has recently published guidance for doctors acting as expert witnesses. There are often situations of overlap between these professional and expert witness roles. For example, a forensic physician may have documented a series of injuries having been asked to assess a victim of crime by the police and then subsequently be asked to express an opinion about causation. A forensic pathologist will produce a report on their post-mortem examination (professional aspect) and then form conclusions and interpretation based upon their findings (expert aspect). The role of an expert witness should be to give an impartial and unbiased assessment or interpretation of the evidence that they have been asked to consider. The admissibility of expert evidence is in itself a vast area of law. Those practising in the USA will be aware that within US jurisdictions admissibility is based on two tests: the Frye test and the Daubert test. The Frye test (also known as the general acceptance test) was stated (*Frye v United States*, 293 F. 1013 (D.C.Cir. 1923) as:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in the twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

Subsequently in 1975, the Federal Rules of Evidence – Rule 702 provided: If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, or training, or education may testify thereto in the form of an opinion or otherwise.

It appeared that Rule 702 superseded Frye and in 1993 this was confirmed in *Daubert v Merrell Dow Pharmaceuticals, Inc.* 509 US 579 (1993). This decision held that proof that establishes scientific reliability of expert testimony must be produced before it can be admitted. Factors that judges may consider were:

Whether the proposition is testable, whether the proposition has been tested, whether the proposition has been subjected to peer review and publication, whether the methodology technique has a known or potential error rate, whether there are standards for using the technique, Whether the methodology is generally accepted.

The question as to whether these principles applied to all experts and not just scientific experts was explored in cases and in 2000 Rule 702 was revised to:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, or training, or education may testify thereto in the form of an opinion or otherwise, provided that (1) the testimony is sufficiently based upon reliable facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods to the facts of the case.

Committee Notes of the Federal Rules also emphasize that if a witness is relying primarily on experience to reach an opinion, that the witness must explain how that specific experience leads to that particular opinion. In England and Wales, His Honour Judge Cresswell reviewed the duties of an expert in the *Ikarian Reefer* case (1993) FSR 563 and identified the following key elements to expert evidence:

1. Expert evidence presented to the court should be, and should be seen to be, the independent product of the expert uninfluenced as to form or content by the exigencies of litigation.
2. An expert witness should provide independent assistance to the Court by way of objective, unbiased opinion in relation to matters within his expertise.
3. An expert witness in the High Court should never assume the role of an advocate.
4. An expert should state facts or assumptions upon which his opinion is based.
5. He should not omit to consider material facts which could detract from his concluded opinion.

6. An expert witness should make it clear when a particular question or issue falls outside his area of expertise.

7. If an expert's opinion is not properly researched because he considers that insufficient data is available, then this must be stated with an indication that the opinion is no more than a provisional one.

8. In cases where an expert witness, who has prepared a report, could not assert that the report contained the truth, the whole truth and nothing but the truth without some qualification, that qualification should be stated in the report.

9. If, after exchange of reports, an expert witness changes his views on a material matter having read the other side's report or for any other reason, such change of view should be communicated (through legal representatives) to the other side without delay and when appropriate to the court.

10. Where expert evidence refers to photographs, plans, calculations, analyses, measurements, survey reports or other similar documents, these must be provided to the opposite party at the same time as the exchange of reports.

A more recent case further clarified the role of the expert witness (Toulmin HHJ in *Anglo Group plc v Winther Brown & Co. Ltd.* 2000)

1. An expert witness should at all stages in the procedure, on the basis of the evidence as he understands it, provide independent assistance to the court and the parties by way of objective unbiased opinion in relation to matters within his expertise. This applies as much to the initial meetings of experts as to evidence at trial. An expert witness should never assume the role of an advocate.

2. The expert's evidence should normally be confined to technical matters on which the court will be assisted by receiving an explanation, or to evidence of common professional practice. The expert witness should not give evidence or opinions as to what the expert himself would have done in similar circumstances or otherwise seek to usurp the role of the judge.
3. He should cooperate with the expert of the other party or parties in attempting to narrow the technical issues in dispute at the earliest possible stage of the procedure and to eliminate or place in context any peripheral issues. He should cooperate with the other expert(s) in attending without prejudice meetings as necessary and in seeking to find areas of agreement and to define precisely areas of disagreement to be set out in the joint statement of experts ordered by the court.
4. The expert evidence presented to the court should be, and be seen to be, the independent product of the expert uninfluenced as to form or content by the exigencies of the litigation.
5. An expert witness should state the facts or assumptions upon which his opinion is based. He should not omit to consider material facts which could detract from his concluded opinion.
6. An expert witness should make it clear when a particular question or issue falls outside his expertise.
7. Where an expert is of the opinion that his conclusions are based on inadequate factual information he should say so explicitly.

8. An expert should be ready to reconsider his opinion, and if appropriate, to change his mind when he has received new information or has considered the opinion of the other expert. He should do so at the earliest opportunity.

These points remain the essence of the duties of an expert within the England and Wales jurisdiction. When an expert has been identified it is appropriate that he is aware of relevant court decisions that relate to his role within his own jurisdictions. Extreme scepticism should be used if an individual claiming to be an expert is unaware of the expected roles and duties they should conform to. Civil court procedure in England and Wales also now allows that, ‘where two or more parties wish to submit expert evidence on a particular issue, the court may direct that the evidence on that issue is to be given by a single joint expert, and where the parties who wish to submit the evidence (‘the relevant parties’) cannot agree who should be the single joint expert, the court may – (a) select the expert from a list prepared or identified by the relevant parties; or (b) direct that the expert be selected in such other manner as the court may direct.’ The aims of these new rules are to enable the court to identify and deal more speedily and fairly with the medical points at issue in a case. Where both parties in both criminal and civil trials appoint experts, courts encourage the experts to meet in advance of court hearings in order to define areas of agreement and disagreement. The duties of an expert are summarized as being that the expert’s duty is to the court and any opinion expressed must not be influenced by the person who requested it, or by whoever is funding it, but must be impartial, taking into account all the evidence, supporting it where possible with established scientific or medical research, and experts should



revise the opinion if further or changed evidence becomes available. This remains an evolving area of law.

EVIDENCE FOR COURTS

There are many different courts in England and Wales, including Coroner, Magistrate, Crown, County and the Courts of Appeal. Court structure in other jurisdictions will have similar complexity and, although the exact process doctors and other professionals may experience when attending court will depend to some extent upon which court in which jurisdiction they attend, there are a number of general rules that can be made about giving evidence. In recent years courts have developed better, but not perfect, communication systems, informing witnesses who are required to give evidence in court of their role and the procedures in place, prior to attendance. In England and Wales all courts have witness services that can respond to questions and those who have never been to court before can have the opportunity of being shown the layout and structure of a court.

STATEMENTS AND REPORTS

A statement in a criminal case is a report that is prepared in a particular form so that it can be used as evidence. There is an initial declaration that ensures that the person preparing the statement is aware that they must not only tell the truth but must also ensure that there is nothing within the report that they know to be false. The effect of this declaration is to render the individual liable for criminal prosecution if they have lied. A statement provided when acting as a professional witness will be based on the contemporaneous notes (notes or

records made at the time of examination), and it is important that the statement fairly reflects what was seen or done at the time. A statement may be accepted by both defence and prosecution, negating the need for court attendance. If, for example, the defence do not accept the findings or facts expressed, the doctor will be called to court to give live evidence and be subject to examination, cross-examination and re-examination. In civil proceedings a different official style is adopted. In these cases a sworn statement (an affidavit) is made before a lawyer who administers an oath or other formal declaration at the time of signing. This makes the document acceptable to the court. In many countries, a statement in official form or a sworn affidavit is commonly acceptable alone and personal appearances in court are unusual. However, in the system of law based on Anglo-Saxon principles, personal appearances are common and it is the verbal evidence – tested by the defence – that is important. If a case comes to trial, any statement made for the prosecution will be made available to all interested parties at the court; at present, the same principle of disclosure does not apply to all reports prepared for the defence in a criminal trial. Thus a defence team may commission a report that is not helpful to the client's defence. This does not have to be disclosed to the prosecution team. The format for reports in civil trial is different. In England and Wales the Ministry of Justice publishes and updates civil, criminal and family procedure rules and practice directions, and these are accessible online. It is important to understand that, although these are published, practice sometime varies from the published rules and directions.

A T T E N D I N G C O U R T

If a citizen is asked to appear as a witness for the court, it is the duty of all to comply, and attendance at court is generally presumed without the need to resort to a written order. Courts in England and Wales generally have specific witness liaison units, that liaise with all participants in a case, attempting (often unsuccessfully) to ensure that the dates of any trial are convenient for all witnesses. Court listing offices try to take into account ‘dates to avoid’ (e.g. clinics or operating sessions, pre-booked holidays or other court commitments), but this is not always successful. When notified that a court case in which you are a witness is going to take place, it is generally possible to agree a specific day on which your attendance is required. However, the court does have total authority and sometimes will compel attendance even when you have other commitments. In this case, a witness summons will be issued. This is a court order signed by a judge or other court official that must be obeyed or the individual will be in contempt of court and a fine or imprisonment may result. Waiting to give evidence involves much time-wasting and frustration, but it is important that witnesses do not delay court proceedings by failure to attend, or being late. Reasons for last-minute changes in the need for court attendance include factors such as a guilty plea being entered on the first day of the trial, or acceptance of a lesser charge.

G I V I N G E V I D E N C E

When called into court, every witness will, almost invariably, undergo some formality to ensure that they tell the truth. ‘Taking the oath’ or ‘swearing in’

requires a religious text (e.g. the New Testament, the Old Testament, the Koran) appropriate to the individual's religious beliefs (if any) or a public declaration can be made in a standard form without the need to touch a religious artefact. This latter process is sometimes referred to as 'affirming'. Regardless of how it is done, the effect of the words is the same: once the oath has been taken, the witness is liable for the penalties of perjury. Whether called as a witness of fact, a professional witness of fact or an expert witness, the process of giving evidence is the same. Whoever has 'called' the witness will be the first to examine them under oath; this is called the 'examination in chief' and the witness will be asked to confirm the truth of the facts in their statement(s). This examination may take the form of one catch-all question as to whether the whole of the statement is true, or the truth of individual facts may be dealt with one at a time. If the witness is not an expert, there may be questions to ascertain how the facts were obtained and the results of any examinations or ancillary tests performed. If the witness is an expert, the questioning may be expanded into the opinions that have been expressed and other opinions may be sought. When this questioning is completed, the other lawyers will have the opportunity to question the witness; this is commonly called 'cross-examination'. This questioning will test the evidence that has been given and will concentrate on those parts of the evidence that are damaging to the lawyer's case. It is likely that both the facts and any opinions given will be tested. The final part of giving evidence is the 're-examination'. Here, the original lawyer has the opportunity to clarify anything that has been raised in cross-examination but he cannot introduce new topics. The judge



may ask questions at any time if he feels that by doing so it may clarify a point or clear a point of contention, or if he thinks counsel are missing a point. The judge may allow the jury to ask questions. However, most judges will refrain from asking questions until the end of the re-examination.

DOCTORS IN COURT

Any medico-legal report must be prepared and written with care because it will either constitute the medical evidence on that aspect of a case or it will be the basis of any oral evidence that may be given in the future. Any doctor who does not, or cannot, sustain the facts or opinions made in the original report while giving live evidence may, unless there are reasons for the specific alteration in fact or opinion, find themselves embarrassed. Any medical report or statement submitted to courts should always be scrutinized by the author prior to signing and submitting it to avoid factual errors (e.g. identifying the wrong site of an injury or sloppy typographical errors). However, any comments or conclusions within the report are based upon a set of facts that surround that particular case. If other facts or hypotheses are suggested by the lawyers in court during their examination, a doctor should reconsider the medical evidence in the light of these new facts or hypotheses and, if necessary, should accept that, in view of the different basis, his conclusions may be different. If the doctor does not know the answer to the question he should say so, and if necessary ask the judge for guidance in the face of particularly persistent counsel. Similarly, if a question is outwith the area of expertise of the witness, it is right and appropriate to say so and to decline to answer the

question. Anyone appearing before any court in either role should ensure that their dress and demeanour are compatible with the role of an authoritative professional. It is imperative that doctors retain a professional demeanour and give their evidence in a clear, balanced and dispassionate manner. The oath or affirmation should be taken in a clear voice. Most court proceedings are tape-recorded and microphones are often placed for that purpose, not for amplifying speech. In some courts, witnesses will be invited to sit, whereas in others they will be required to stand. Many expert witnesses prefer to stand as they feel that it adds to their professionalism, but this decision must be matter of personal preference. Whether standing or sitting, the doctor should remain alert to the proceedings and should not lounge or slouch. The doctor should look at the person asking the questions and, if there is one, at the jury when giving their answers; they should remain business-like and polite at all times. Evidence should also be given in a clear voice that is loud enough to reach across the court room. Take time in responding and be aware that judges (and lawyers) will be writing down or typing responses. Most witnesses will at some time have been requested to ‘Pause, please’ as the legal profession attempt to keep up with complex medical or scientific points. When replying to questions, it is important to keep the answers to the point of the question and as short as possible: an over-talkative witness who loses the facts in a welter of words is as bad as a mono-syllabic witness.

Questions should be answered fully and then the witness should stop and wait for the next question. On no account should a witness try to fill the silence with an explanation or expansion of the answer. If the lawyers want an explanation

or expansion of any answer, they will, no doubt, ask for it. Clear, concise and complete should be the watchwords when answering questions. Becoming hostile, angry or rude as a witness while giving evidence does not help in conveying credibility of the witness to a court. Part of the role of the lawyers questioning is to try and elicit such responses, which invariably are viewed badly by juries – expect to have qualifications and experienced and opinions challenged. It is important to remember that it is the lawyers who are in control in the courtroom and they will very quickly take advantage of any witness who shows such emotions. No matter how you behave as a witness, you will remain giving evidence until the court says that you are released; it is not possible to bluff, boast or bombast a way out of this situation – and every witness must remember that they are under oath. A judge will normally intervene if he feels that the questioning is unreasonable or unfair. A witness must be alert to attempts by lawyers unreasonably to circumscribe answers: ‘yes’ or ‘no’ may be adequate for simple questions but they are simply not sufficient for most questions and, if told to answer a complex question ‘with a simple “yes” or “no” doctor’, he should decline to do so and, if necessary, explain to the judge that it is not possible to answer such a complex question in that way. The old forensic adage of ‘dress up, stand up, speak up and shut up’ is still entirely applicable and it is unwise to ignore such simple and practical advice.

P R E P A R A T I O N O F M E D I C A L R E P O R T S

The diversity of uses of a report is reflected in the individuals or groups that may request one: a report may be requested by the police, prosecutors, Coroners, judges, medical administrators, government departments, city authorities or lawyers of all types. The most important question that doctors must ask themselves before agreeing to write a report is whether they (1) have the expertise to write such a report and (2) have the authority to write such a report. A good rule of thumb is to ensure that, when medical records will need to be reviewed, written permission to access and use those records has been given, either by the individual themselves, or by an individual or body with the power to give that consent. If consent has not been sought, advice should be sought from the relevant court or body for permission to proceed. The fact of a request, even from a court, does not mean that a doctor can necessarily ignore the rules of medical confidentiality; however, a direct order from a court is a different matter and should, if valid, be obeyed. Any concerns about such matters should be raised with the appropriate medical defence organization.

M E D I C A L C O N F I D E N T I A L I T Y

In general terms the consent of a living patient is required and, if at all possible, this should be given in writing to the doctor. There are exceptions, particularly where serious crime is involved. In some countries or jurisdictions both doctor and patient may be subject to different rules that allow reports to be written without consent. If no consent was provided, this should be stated in the



report, as should the basis on which the report was written. Any practitioners should make themselves aware of the relevant laws and codes of conduct applicable to them within their current jurisdiction. In general, in most countries it is considered inappropriate for non-judicial state agencies to order a doctor to provide confidential information against the wishes of the patient, although where a serious crime has been committed the doctor may have a public duty to assist the law-enforcement system. It is usual for the complainant of an assault to be entirely happy to give permission for the release of medical facts so that the perpetrator can be brought to justice. However, consent cannot be assumed, especially if the alleged perpetrator is the husband, wife or other member of the family. It is also important to remember that consent to disclose the effects of an alleged assault does not imply consent to disclose all the medical details of the victim, and a doctor must limit his report to relevant details only. Mandatory reporting of medical issues may be relevant in some countries; often these relate to terrorism, child abuse, use of a weapon and other violent crime.

STRUCTURE OF A STATEMENT OR REPORT

The basis of most reports and statements lies in the contemporaneous notes made at the time of an examination and it is essential to remember that copies of these notes will be required in court if you are called to give live evidence. Many court or tribunal settings have specific protocols for written report production but in general most will include the information and details

referred to below. When instructed to prepare an expert report always clarify whether or not a specific structure is required and if so, follow it assiduously.

A simple professional witness statement (one that simply reports facts found at examination) will be headed by specific legal wording. Included may be the doctor's professional address and qualifications should follow. The date of the report is essential and the time(s), date(s) and place(s) of any examination(s) should be listed, as should the details of any other person who was present during the examination(s). Indicate who requested the statement, and when. Confirm your understanding of your role at the time (e.g. 'I was called by the police to examine an alleged victim of assault to document his injuries'). Confirm that the patient has given consent for the release of the medical information (if no consent is available it must be sought). By referral to contemporaneous notes outline the history that you were aware of (... 'Mr X told me that...'). In simple terms summarize your medical findings. If information other than observation during a physical examination (e.g. medical records, X-rays) forms part of the basis of the report, it too must be recorded. Clarity and simplicity of expression make the whole process simpler. Statements can be constructed along the same lines as the clinical notes – they should be structured, detailed (but not over-elaborate – no one needs to be impressed with complex medical and scientific terms) and accurate. Do not include every single aspect of a medical history unless it is relevant and consent has been given for its disclosure. A court does not need to know every detail, but it does need to know every relevant detail, and a good report will give the relevant facts clearly, concisely and completely, and in a way that an



intelligent person without medical training can understand. Medical abbreviations should be used with care and highly technical terms, especially those relating to complex pieces of equipment or techniques, should be explained in simple, but not condescending, terms.

Abbreviations in common usage such as ECG can generally be used without explanation although occasionally further explanation is required. It is preferable not to submit handwritten or proforma type statements unless absolutely unavoidable. A clear, concise and complete report or statement may prevent the need for court attendance at all, and if you do have to give evidence, it is much easier to do so from a report that is legible. The contemporaneous clinical notes may be required to support the statement and it is wise to ensure that all handwriting within such notes has been reviewed (and interpreted) prior to entering the witness box. Autopsy reports are a specialist type of report and may be commissioned by the Coroner, the police or any other legally competent person or body. Again, as with expert reports, there may be standardized protocols or proforma. The authority to perform the examination will replace the consent given by a live patient, and is equally important. The history and background to the death will be obtained by the police or the Coroner's officer, but the doctor should seek any additional details that appear to be relevant, including speaking to any clinicians involved in the care of the deceased and reviewing the hospital notes. A visit to the scene of death in non-suspicious deaths, especially if there are any unusual or unexplained aspects, is to be encouraged. An autopsy report is confidential and

should only be disclosed to the legal authority who commissioned the examination. Disclosure to others, who must be interested parties, may only be made with the specific permission of the commissioning authority and, in general terms, it would be sensible to allow that authority to deal with any requests for copies of the report. Doctors must resist any attempt to change or delete any parts of their report by lawyers who may feel those parts are detrimental to their case; any requests to rewrite and resubmit a report with alterations for these reasons should be refused. Lawyers may sometimes need to be reminded of the role of the doctor and their duties, both as doctors and as experts. Pressure from lawyers to revise or manipulate a report inappropriately warrants referral to their professional body, and the court should be informed. The doctor should always seek the advice of the judge of matters arising that may result in potential breaches of these important duties.

DOCTORS AND THE LAW

Doctors and other professionals may become involved with the law in the same way as any other private individual: they may be charged with a criminal offence or they may be sued through the civil court. A doctor may also be witness to a criminal act and may be required to give evidence about it in court. However, it is hoped that these examples will only apply to the minority of professionals reading this book. For most, the nature of the work may result in that individual providing evidence that may subsequently be tested in court. For doctors are circumstances in which doctors become involved with the law simply because they have professional skills or experience. In these cases, the



doctor (or other professional) may have one of two roles in relation to the court, either as a professional or as an expert witness, the delineation of which can sometimes overlap.

FORENSIC SCIENCE DISCIPLINES

RECONSTRUCTION OF THE CRIME SCENE

Previous talks of identification and comparison techniques have emphasized the laboratory work that forensic scientists do on a regular basis. However, forensic scientists have another function to play in the course of a criminal investigation: they work as part of a team to recreate events that occurred before, during, and after the commission of a crime.

To optimize crime-scene reconstruction, law enforcement professionals must take correct measures to improve all parts of the crime scene search. The first and most crucial step is to secure and protect the crime scene. From the beginning until the completion of the search, protecting the scene is a constant effort. People trampling through the site can unwittingly alter or destroy evidence that could be crucial to reconstructing the crime scene, rendering it useless. The topic of suspected evidence contamination will very probably be raised during the trial, and it could be the difference between a guilty or not-guilty result.

The investigator should conduct a preliminary inspection of the crime scene as it was left by the criminal before processing it for physical evidence. Each crime scene is unique in its circumstances. In recreating a crime, the

investigator's experience and the availability or absence of tangible evidence become key considerations. By completing a first walk-through of the crime scene and considering the events that occurred, the investigator captures the nature of the scene as a whole. He or she can make educated guesses about what happened, where it happened, and when it happened based on the physical evidence available to the naked eye. The investigator's job throughout the walk-through is to record observations and come up with a plan for how the scene should be handled in the end. Any and all observations should be documented through photographs, sketches, and notes as the collecting of tangible evidence begins. The investigator can begin to piece together the sequence of events that occurred during the commission of the crime by collecting physical evidence and thoroughly documenting the crime scene.

Reconstruction is a collaborative endeavor that requires multiple professionals piecing together many pieces of a puzzle because detectives analyze several sorts of evidence while reconstructing a crime scene. The entire team strives to answer the traditional "who, what, when, where, why, and how" questions that arise at a crime scene. Reconstruction frequently necessitates the participation of law enforcement, a medical examiner, and/or a criminalist. Each of these experts brings a unique viewpoint to the crime-scene reconstruction process. Is it possible that more than one person was involved? What method was used to assassinate the victim? Was anything done to hide what happened? The victim's position in a crime scene can often offer important details for the investigation. Trained medical examiners can examine a person at a crime scene and evaluate the livor distribution within the corpse to see if the body has been moved after

death. If livor has developed in places different than those closest to the ground, for example, the medical examiner can deduce that the victim was likely transferred after death. Similarly, because livor does not develop in parts of the body that are confined by clothing, the examiner can tell whether the subject was clothed after death.

A criminalist or a professional crime-scene investigator can also contribute unique talents to the reconstruction of events that occurred during a crime. A criminal utilizing a laser beam to map the approximate bullet path via trajectory analysis, for example, can aid in determining the shooter's probable position in relation to the victim. Other skills a criminalist might use during a crime-scene reconstruction analysis include determining the direction of impact of projectiles penetrating glass objects, locating gunshot residues deposited on the victim's clothing to estimate the distance of a shooter from a target, and searching for primer residues deposited on a suspect shooter's hands, among others.

The practice of examining and analysing physical evidence and statements made by individuals engaged in the incident to establish a plausible sequence of events at a crime scene is known as crime-scene reconstruction. Information from re-enactments could potentially be used as proof. As a result, when investigators apply correct documentation and gathering methods for all forms of evidence, reconstructions have the best chance of being accurate.

Physical evidence left at a crime scene is critical in reconstructing the chain of events leading up to the crime. Although the evidence may not be able to explain everything that happened, it might corroborate or refute witness and/or

suspect narratives. Physical evidence can also be used to develop leads and confirm the court's reconstruction of a crime scene. The cornerstone of a reconstruction is the collecting, documentation, and interpretation of physical data. By observing and evaluating physical data, as well as witness accounts and input from individuals involved in the incident inquiry, reconstruction creates a likely sequence of events. The analysis of all relevant data will aid in the creation of a suitable reconstruction model.

Aspects to follow;

- Friction Ridge Analysis (Latent Fingerprints)
- Firearm (ballistics) Examination
- Forensic Odontology
- Impression Evidence (tires, footwear)
- Bloodstain patterns
- Questioned Documents (handwriting, digital sources, dating)
- Cyber Forensics
- Hair Analysis
- Medical Opinion
- Drug Chemistry
- Forensic DNA
- Forensic Toxicology
- Polygraph analysis

CHAPTER THREE



FORENSIC SCIENCE AND THE LAW

The problem is not teaching the inferrer to think: the problem is the examination of how inferences have been made by another and what value his inferences may have for our own conclusions. Dr. Hans Gross, 1924

Forensic criminologists perform criminological assessments for the purpose of addressing investigative and legal questions. Criminological assessments are, simply put, those types of inquiries and examinations traditionally performed by a criminologist. This admittedly circular definition actually encompasses a wide variety of analyses that are beyond the general understanding of most jurors, let alone many nonforensic criminologists. As will be made clear, they are also a regular feature of both criminal and civil proceedings. This chapter is aimed at providing the common guise and context for examinations and expert testimony that tend to fall within the aegis of forensic criminology. It is not meant to be all-inclusive; rather, it will give readers a sense of the major assessments provided by criminologists to law enforcement agencies, private clients, and before the court. For reference purposes, we also make an effort to delineate the investigative and forensic value of each. Case examples are also provided.

Liability: In civil disputes, the measure of responsibility that a group or individual incurs for any harm that has been caused. Misdemeanors: Lesser

criminal offenses involving little if any actual jail time. Motive: The emotional, psychological, and material needs that impel and are satisfied by behavior. Plaintiff: (a.k.a. claimant or pursuer) the party that initiates a lawsuit; the party claiming to have been wronged and/or injured in civil cases. Premises Liability: A landowner's duty to protect individuals from harm, including third-party assaults (La Fetra, 2006). Prosecution: The attorney or attorneys representing the state who are responsible for bringing criminal charges against defendants based on the investigations of complaints conducted by law enforcement agencies. Psychological Autopsy: An evaluation of a decedent's mental state prior to death. Suicide Psychological Autopsy (SPA): An examination with the purpose of understanding which psychosocial factors have contributed to a suicide. Torts: Wrongful acts that cause or lead to the infringement of an individual's rights and result in legal liability. Victim Exposure: The amount of exposure to harmful elements experienced by a victim. A function of lifestyle and incident exposure

CRIMINAL VERSUS CIVIL COURTS

Criminal Versus Civil Courts Owing perhaps to the cultural popularity and subsequent proliferation of violent crime dramas involving police investigators, prosecutors, and criminal defense attorneys, the vast majority of the public seems to believe that they have good idea of what goes on in court. Moreover, they tend to apply what they have learned about criminal law, often from inaccurate fictionalized depictions related through film or television, to the civil arena. This has created a situation in which even the best of our criminology

and criminal justice students do not understand the major differences between criminal and civil proceedings, let alone that differences exist at all. The following sections seek to ameliorate the problem by offering limited discussions regarding the major distinctions between criminal and civil courts. It is important to understand that forensic criminology is practiced in both.

JURISDICTION

The first area to consider when distinguishing between criminal and civil proceedings is related to jurisdiction, or authority. Criminal courts have jurisdiction over crimes committed against the state as set forth in a criminal code, to include misdemeanors and felonies. Misdemeanors are lesser criminal offenses involving little if any actual jail time. Felonies are serious criminal offenses that involve imprisonment. There are no uniform definitions for these terms beyond the basic distinctions provided here, as every jurisdiction handles them differently. What may be a felony in one country or state may be a lesser felony or a misdemeanor in another (if it is a crime at all). Most jurisdictions have their own unique criminal code in which laws detailing the nature of criminal offenses, and any subsequent penalties, are outlined. This is true within both Australia and the United States, where there are separate criminal codes for federal crimes and individual states or territories. In the United Kingdom, however, England and Wales do not have a precise criminal code. Rather, they have a common law system without the benefit of specific legal statutes. In a common law (a.k.a. case law) system, crimes and punishments are dictated by a contemporary interpretation of prior court decisions passed down through history. In the UK, common law decisions are

monitored by The Law Commission, an independent government agency created by the Law Commissions Act of 1965 to keep common law under review and recommend reforms as needed.¹ Civil courts, on the other hand, have jurisdiction over statutes set forth in a code of civil procedure. They handle noncriminal disputes between the state, private corporations, and individuals. This can include disagreements within the confines of family law (e.g., marriage, civil unions, divorce, spousal abuse, child custody and visitation, alimony, child support, and adoption), property law, contract law, and tort law. Torts are wrongful acts that cause or lead to the infringement of an individual's rights and result in legal liability; they feature prominently in the assessments section of this chapter.

LEGAL PARTIES

The legal parties involved in criminal disputes are different from those involved in civil disputes. Criminal court cases are brought by the state against an individual. The state is also referred to as the prosecution. The prosecution, helmed by a prosecutor or a district attorney, brings criminal charges based on the investigations of complaints conducted by law enforcement agencies. In criminal cases, the person accused of committing a crime is referred to as the defendant. Civil court cases are brought against governments, corporations, and individuals against each other. The plaintiff (a.k.a. the claimant or the pursuer) is the party that initiates the lawsuit; it is the party claiming to have been wronged and/or injured. In civil cases, the person accused of causing harm is also referred to as the defendant (a.k.a. the defender). The plaintiff is

required to set forth and prove the wrongs committed by the defendant, as well the nature of any relief, or damages, being sought.

THE BURDEN OF PROOF

The burden of proof is the major difference between criminal and civil cases. This refers to the responsibility of demonstrating the truth and validity of disputed charges or allegations. In criminal cases, the prosecution holds the burden of proof. They must prove their case beyond a reasonable doubt. This means that the trier of fact must be “fully satisfied, entirely convinced, satisfied to a moral certainty” (Black, 1990, p. 161). This is a very high standard, akin to a 98% or 99% certainty on the part of the trier of fact. In civil cases, the burden of proof is on the plaintiff; however, the plaintiff needs only prove his or her case to a “preponderance of evidence” or a “clear and convincing evidence” standard. This is akin to a certainty greater than 50%, or “more probable than not” (Black, 1990, p. 1183). This lowered standard also effectively shifts a burden of proof onto the defendant. In criminal trials the prosecution must prove guilt to more than 98% certainty; in civil trials one side must prove that it is at least 51% in the right. It must be noted that these evidence standards are highly subjective in application, and in many courts they are also poorly explained.

R I G H T S

Criminal defendants enjoy far more legal protection than do defendants in civil actions. For example, criminal defendants in the United States have the right not to testify against themselves, the right to a speedy trial, and the right to competent legal representation. Civil defendants do not. Moreover, criminal

defendants may not be tried twice for the same crime, or a similar lesser crime, for the same offense (double jeopardy). For civil defendants, this is a distinct possibility. And criminal prosecutors are barred from appealing a verdict of “not guilty,” while plaintiffs in civil actions commonly exercise their right to appeal judgments of nonliability as soon as it is rendered.

LEGAL CONSEQUENCES

Perhaps the greatest difference between criminal and civil disputes resides in the nature of legal consequences. In criminal cases, the court system seeks to determine who is culpable with respect to a crime. It is about assigning blame and demonstrating that a defendant acted “purposefully, knowingly, recklessly, or negligently” (Black, 1990, p. 379). Those found criminally culpable may suffer financial penalties, but generally risk losing their liberty and even their life under extreme circumstances. When a defendant is charged with a felony, prison looms as a very real consequence at the close of a criminal trial. Conversely, there are generally no criminal sanctions for prosecutors who fail to make their case, unless extreme prosecutorial malfeasance can be proved. In civil cases, however, the court system seeks to determine who is legally liable. That is to say, civil proceedings are meant to determine the nature and extent of any harm, who caused it, and the extent of any responsibility to compensate for damages incurred. Those parties found civilly liable can suffer financial penalties, as well as the loss of rights, property, and other assets. Furthermore, prison does not exist as a penalty in civil cases. However, if a plaintiff fails to make his or her case to a judge or

jury, he or she may be required to repay all or some of the legal costs incurred by the defense.

DUTIES OF THE EXPERT

Whenever a court requires scientific or knowledgeable opinions to assist with establishing the likelihood or plausibility of a theory, or to support an argument being made by counsel, forensic experts are employed (Anderson, 1987). As explained in Van der Hoven (2006, p. 152):

Expert testimony in criminal courts has a long history. The necessity for expert witnesses who are more qualified than the court to express their opinion regarding certain matters, has been acknowledged since the 14th century (Schmidt & Rademeyer 2000:463; Pretorius 1997:334). According to Anderson (1987:12) social science research was formally introduced into the judicial system in 1908 by Louis Brandeis in *Muller v Oregon*. Since the 1950s social scientists in the United States have played a pivotal role as expert witnesses in litigation regarding school desegregation. Behavioural and social scientists with criminological and criminal justice expertise have increasingly been requested to appear as expert witnesses. It has been said that it is not unreasonable to ask that “expert witnesses who are called upon to testify, either against the defendant or in his behalf, know what they are doing,” given everything at stake in a trial (Thornton, 1974, pp. v–vi). In other words, the expert has a responsibility to be knowledgeable, adept, and to generally refrain from the vice that is ignorance of their subject matter. Otherwise, they are essentially

unworthy of offering expert opinions and testimony of any kind. Specific duties of the forensic expert are set forth in Dwyer (2008, pp. 96–97):

The concept of an expert's duty was developed further by Cresswell J in *The Ikarian Reefer* in 1993. These principles, which to varying degrees had already emerged elsewhere at common law, are of sufficient significance in the development of the concept of an expert's duties to warrant full quotation:

1. Expert evidence presented to the court should be, and should be seen to be, the independent product of the expert uninfluenced as to form or content by the exigencies of litigation ... (*Whitehouse v Jordan* [1981] 1 W.L.R. 246 at 256, per Lord Wilberforce).
2. An expert witness should provide independent assistance to the court by way of objective unbiased opinion in relation to matters within his expertise (see *Polivitte Ltd v Commercial Union Assurance Co plc* [1987] 1 Lloyd's Rep. 379 at 386, per Garland J. and *In re J* [1990] F.C.R. 193, per Cazalet J.). An expert witness in the High Court should never assume the role of an advocate.
3. An expert witness should state the facts or assumptions upon which his opinion is based. He should not omit to consider material facts which could detract from his concluded opinion (*In re J*).
4. An expert witness should make it clear when a particular question or issue falls outside his expertise.
5. If an expert's opinion is not properly researched because he considers that insufficient data is available, then this must be stated with an indication that the opinion is no more than a provisional one

(In re J). In cases where an expert witness who has prepared a report could not assert that the report contained the truth, the whole truth and nothing but the truth without some qualification, that qualification should be stated in the report (*Derby & Co Ltd v Weldon*, *The Times*, 9 November 1990, per Staughton LJ).

6. If, after exchange of reports, an expert witness changes his view on a material matter having read the other side's expert's report or for any other reason, such change of view should be communicated (through legal representatives) to the other side without delay and when appropriate to the court.

7. Where expert evidence refers to photographs, plans, calculations, analyses, measurements, survey reports or other similar documents, these must be provided to the opposite party at the same time as the exchange of reports. See *National Justice Compania v Prudential Assurance* [1993] 2 Lloyd's Rep 68, Comm. Ct ('The Ikarian Reefer')

Approved by Otton LJ in *Stanton v Callaghan* [2000] QB 75, [1999] 2 WLR 745, CA. These specific duties, provided from within a British context, are applicable on an international scale. They are useful as a guide whether one works as an expert witness in Los Angeles, South Africa, Sydney, or London. They are also relevant to and consistent with other practice standards discussed throughout this text. It is in the context of criminal and legal proceedings, and within the scope of the duties defined here, that forensic criminological assessments are performed.

Forensic criminologists are both scholars and practitioners. They are therefore required to work comfortably in academic, investigative, and legal realms. Rather than being a product of “occupational affinity” (Morn, 1995, p. 79), they are the result of scientific education and training, tempered by mentoring, peer review, and case experience. Their profession is a conscious choice rather than an incidental civil service job title. This will be reflected in their ability to competently and scientifically perform criminological assessments with a high degree of functional literacy. There are essentially three kinds of criminological evidence presented at trial: theory presentation, the results of research/surveys, and evidence examination/ assessment.

Theory Presentation: This involves the presentation of any criminology theory to the court, to be used as a building block for arguments to be made by attorneys, or in consideration by the jury when dealing with questions related to the ultimate issue. For example, a well-trained criminologist is the best expert to present evidence regarding Routine Activity Theory and its application within a specific case. Routine Activity Theory explains crime by consideration of three converging elements: likely offenders, suitable targets, and the absence of capable guardians (Reid, 2006). The forensic criminologist could either explain this theory to a judge or jury in general terms, so that they could consider it in their deliberations on a related matter; or they could take this theory into consideration as an applied part of any related analysis. The forensic criminologist could also provide testimony to rebut that of any would-be criminologist offering related opinions without its consideration. This is just one example from many.

The Results of Research Surveys: Criminologists

are known for conducting and publishing scholarly research. The results of that research may have a direct bearing on questions that arise in criminal and civil proceedings. For example, one of the authors has published research in the area of staged crime scenes (Turvey, 2000; Turvey, 2004; Turvey, 2008a), as well as false reporting (Baeza and Turvey, 2000; Savino and Turvey, 2004; Turvey, 2008a). As a regular feature of testimony in homicide and sex crime trials, in both criminal and civil arenas, the author has been asked to explain that crime scene staging and false reporting exist as actual phenomena, and to define the limits of these terms as they are used in case examination. Additionally, the author has been asked to explain whether research findings tend to lend credibility to the theory that a crime scene was indeed staged, or whether adequate consideration and due diligence were afforded by investigators to the possibility that a complaint of a rape may be false. With respect to both crime theory and criminology research presentation in court, consider the following discussion from Van der Hoven (2006, pp. 155–156):

The study field of criminology involves the social sciences as well as elements of criminal law. Bartol (1999:3) considers criminology as the multidisciplinary study of crime. Reid (2003: G3) defines the term criminology as the scientific study of crime, criminals, criminal behaviour and efforts to regulate crime. According to Dantzker (Hunter & Dantzker 2002:24), criminology is the scientific approach to the study of crime as a social phenomenon, that is, a theoretical application involving the study of the nature and extent of criminal behaviour.

Terblanche (1999:10) describes the field of study of criminology as follows: “Criminology, broadly speaking, studies crime, criminals, victims, punishment and the prevention and control of crime. The most important role of a criminologist is to study crime, and to interpret and explain crime.” In the past, the emphasis was on explaining the behaviour of the offender, but the emphasis has recently shifted to include analysis of the consequences of imposed sentences. This makes it all the more important for judicial officers to take note of the research done by criminologists.

Criminologists such as Reid (2003:xvii–xx), Siegel (2004:xv–xvi) and Bartol (1999:v–viii) identify the following main areas of criminology:

Criminal statistics (measuring crime patterns and trends); Distribution of criminal behaviour amongst gender, age and ethnic groups Detailed studies of specific types of crime (economic crimes, crimes of violence, etc.) Causes of crime and criminality (biological, psychological, social factors) Theoretical explanations of crime (various perspectives) Impact of crime on individuals and communities; Social origin of the criminal law, development of laws and the role of law in society, as well as the function of legislation Societal reaction to crime Criminal Justice Administration, including the police and legal professions Correctional programmes Victimology (the nature and cause of victimisation as well as aiding crime victims).

Briefly, it can be stated that criminologists are trained in the social sciences and focus mainly on the causes, explanation and prevention of criminal behaviour. The study field includes the profiling of offenders as well as of victims of

crime. The main emphasis is therefore on the individuals involved in the criminal act.

Dr Irma Labuschagne (2003:5) rightly points out that criminology not only focuses on individual criminal behaviour, but also on all environmental circumstances, as well as the context within which the criminal was functioning when the crime was committed.

Criminologists specifically study the criminal in all his facets, such as causal factors contributing to the criminal event, predisposition (e.g. personality make-up, genetic factors), precipitating factors, triggering factors, the interaction between the offender and the victim, victim vulnerability, victim rights, role of the victim in the criminal justice process, the criminal justice process, the prevention of crime and victim support, et cetera. Criminological studies involve personality and sexual deviations, for example the antisocial personality, paedophilia, violent offenders, rapists, and phenomena such as domestic violence, school violence and workplace violence.

Criminologists focus on the causes, dynamics, theoretical explanation and prevention of violent behaviour. They also study the offender's patterns of criminal behaviour in the past to predict his or her behaviour in future. This discussion is useful as it defines the role of criminologist not only as a scholar who understands criminological research, crime theory, and crime- victim psychodynamics, but also as a practitioner who can apply this understanding to assessing the facts and circumstances of a given case. Evidence Examination/Assessment: Criminologists of every kind may be asked to

perform examinations and assessments of the evidence gathered in relation to a particular case. The following are some common examples.

Custom, Practice, and guidelines Criminologists who are familiar with cultural customs, standards of professional practice, or professional guidelines may be allowed testify in court regarding (1) their existence; (2) what they are and what they mean; and (3) whether they were followed by actors in the case at hand. The trier of fact is then left to sort out what that means with respect to the ultimate issue. Consider the following relevant findings provided by one of the authors (Turvey) in a Forensic Examination Report prepared for criminal defense attorney Jim Gray in anticipation of trial testimony for *Mississippi v. Robert Grant* (2006) (Turvey, 2006): Conclusion #1: Law enforcement efforts to secure and process the crime scene were almost non-existent, and consequently did not meet the minimum national standards for competent forensic practice with respect to adhering to the “fundamental principles of investigating a crime scene and preserving evidence that should be practiced in every case.” (TWGCSI, 2000, pp. 1–2)

Because of the failure to meet minimum crime scene practice standards, many key items of potentially exculpatory physical evidence were not documented, collected, preserved, or tested. The report went on to explain which standards of practice were violated and how, and also which items of evidence were not collected and subsequently tested.

As evidenced by this example, taken from among many, findings related to adherence with guidelines and practice standards may be useful in a forensic context to establish a line of questioning for opposing counsel, and to educate

the trier of fact regarding whether a reasonable standard of care was met by those subordinate to him or her. They may also be used to confirm or refute the strength of arguments based on the solvency of evidence collected in and out of compliance with those standards. Equally important, the trier of fact may use ignorance of basic national protocols to gauge the solvency of other law enforcement efforts and case theories.

OFFENDERS

Classification

Criminologists create and employ various classification schemes and typologies to describe offenders, their offenses, and their victims. Rather than being treatment oriented, these schemes are designed for investigative and research purposes, to develop a deeper understanding of the relationships between crime, criminals, and their victims. There are behavioral-motivational typologies, serial murder typologies, stalker typologies—the list is endless. Forensic criminologists are best suited to apply these classification systems within a given case during either the investigation or to interpret their meaning during expert testimony at trial when there is a dispute regarding appropriate usage. Moreover, such classifications and typologies are not treatment oriented, so they are also not diagnostic in nature and therefore not the purview of mental health professionals without the appropriate criminological background. Additionally, the court and attorneys have been known to use or develop offender classifications that are well within the expertise of forensic criminologists to decipher. Consider the following examples.

Example #1: “Thrill Kill” Reports were as follows (Turvey, 2006b)

On Monday, January 27, 1992, the body of Victor Esparza was found in a cubicle at the main office of Sam & Libby’s in a secured building at 1123 Industrial Road, San Carlos, California. He was the night janitor under contract to clean the premises. Cause of death was a penetrating gunshot wound to the head fired at a distance of 6 to 12 inches. His wallet had been stolen.

On Thursday, March 12, 1992, the body of Caroline Gleason was found in the copy room of Sophia Systems at 777 California Ave, Palo Alto, California. She was the office manager of that business. Cause of death was a near contact perforating gunshot wound to the head. Her keys, purse, and car were subsequently stolen.

On Monday, March 16, 1992, Dr. Allan Marks, a pediatrician, was attacked by a black female intruder in the front doorway of his office at 801 Brewster #250 in Redwood City, California, a few minutes subsequent to concluding an after hours appointment with a patient and his parents. A struggle ensued when the female intruder tried to enter the office, and Dr. Marks suffered three gunshot wounds before managing to push her out into the hallway: one in the left shoulder, one in the right forearm, and one in the left thumb (the thumb wound may have been received in conjunction with one of the other injuries, as only two projectiles were recovered). He subsequently called 911.

Celeste S. Carrington, an unemployed black female janitor, was connected to the case by virtue of her previous employment for janitorial services contracted

to the locations involved, and by virtue of her physical description as provided by eyewitness accounts. On March 20, 1992, she was arrested. After initially denying involvement in these crimes, she ultimately made a full taped confession to investigators to these and other related offenses. These confessions were rendered over the course of a single evening—Carrington met with multiple investigators from multiple law enforcement agencies.

In May and June of 1994, Carrington was tried for these crimes, convicted, and sentenced to death. She appealed that sentence.

During closing arguments at trial, the prosecution referred to the defendant as a “thrill killer.” During the appeal, the defense asked one of the authors (Turvey) to, among other tasks, assess the appropriateness of this inflammatory offender classification. Taken from the expert declaration in that case is the following conclusion and its basis (Turvey, 2006):

Given these facts and circumstances, it is my expert opinion that there is no definitive support for the theory that Gleason was kneeling when she was shot. The facts and circumstances in the Esparza, Gleason, and Marks cases are entirely inconsistent with a “Thrill Kill” or Thrill-Oriented motivation.

Throughout the state’s closing arguments at both guilt and sentencing phases of the trial, the prosecutor repeatedly asserts that Celeste Carrington was motivated by the thrill she received from her enjoyment of killing. See, e.g., page 5047 (“we have a thrill killer on our hands...”); page 6671 (“This is a death penalty case because of her brutality, her thrill, her enjoyment in killing. It sets it apart from a whole class of crimes because of the circumstances attending the crime.”) page 6678 (“These weren’t just murders during the

course of robberies and burglaries. There were more serious things going on, and we'll talk about that, being on their knees, being shot at close range. Cold blooded, and the thrill of it all in her statement, enjoying it."); page 6691 (a predator like Celeste Simone Carrington, who slaughters innocent human beings for the thrill of it..."); page 6692 ("a predator who enjoyed slaughtering human beings.").

The concept of the "Thrill Killer" originated as a feature of the popular media, used to sell newspapers and true crime novels. By the late 1980s, the concept of the "thrill killer" had been incorporated into the professional serial murder literature in the textbook *Serial Murder* (1988). This seminal text provides dominant motives for murder patterns, including the "Thrill-Oriented" murder. Of the Thrill-Oriented type, DeBurger & Holmes (1988, p. 76–77) write the following: "The central motive in this type of serial murder typically reflects a quest for 'highs,' thrills, or excitement. In the asocial logic of the thrill killer's sociopathic mind-set, the excitement connected with the kill overrides any concern or sympathy for the victim. This type of perpetrator tends to focus on the process of killing instead of simply carrying out a quick act of murder... the thrill-oriented murderer is primarily impelled to kill not by sexual motives, but by a craving for excitement or bizarre experience. In short, the act or process of killing is enjoyable for this kind of serial murderer."

In my expert opinion, Thrill-Oriented motivation is eliminated as a possibility in all three cases I have reviewed based primarily on the following considerations:

a) Carrington selected locations where she had worked in the past, because she knew the security,

knew the work schedules, knew how to gain entry, knew the layouts, knew the specific types of

valuables that could be found, and often had retained a key.

b) Carrington specifically chose to enter buildings at times when there was little or no chance of encountering anyone. This was to facilitate protracted, uninterrupted searches for valuables.

c) In none of the cases could Carrington have planned to encounter anyone. At Sam & Libby's, her entry was detected because the security procedures had changed; at Marcus & Millichap, she was encountered by an employee who had chanced to come in after hours; and she encountered Dr. Allan Marks in his office only because he had an atypical, after-hours appointment. These encounters could not have been anticipated, and the shootings are much more suggestive of a reactive response to unexpected circumstances.

d) In each case, Carrington was focused on entering the place of business in search of specific types of valuables to steal. At Sam & Libby's she was searching for cash in desks; at Marcus & Millichap she was searching for cash and money order blanks; at Dr. Marks's building she was searching for drugs in the emergency medical kit. Moreover, in both homicide cases, she took valuables from the victims.

e) In each homicide case, Carrington engaged a "con" to dissuade the victim from considering her a threat, in order to avoid suspicion. She told Esparza that she worked for Sam & Libby's, and she told Gleason that she worked in the

building as a janitor.

f) These crimes all were committed in a manner to lower the risk of detection and avoid people. This directly contradicts the primary motive of the Thrill Killer, who tends to impulsively commit murder with low skill, and high risk of detection, with the explicit intent of direct contact with victims.

g) Carrington used a stolen gun, happened upon in the course of a burglary, to commit the shootings. She apparently used only the limited rounds of ammunition that she originally stole with the gun. A Thrill Killer would have shown excitement, arousal, or enthusiasm towards this instrument of killing in some fashion (buying lots of ammunition; excessive cleaning; stealing more firearms; flashing the firearm to others, etc.).

h) After an exhaustive review of the taped interviews of Carrington by law enforcement, I detected no verbal excitement, arousal, or interest in describing or reliving the murders with investigators. Rather, Carrington demonstrated a flat affect (i.e., no emotion, detachment) throughout the confessions. Everything was delivered in a matter of fact fashion. This is in stark contrast to those offenders who could be labeled Thrill Killers, who discuss their crimes with passion, interest, and excitement. They enjoy reliving their crimes for others, and would not be characterized by a flat affect.

Example #2: “Sexually Violent Predator”

Consider the court’s ruling in *Commonwealth v. Conklin (2006)*, described in *Takah (2006)*, which provides that to meet the burden of proving that a sex offender is a “sexually violent predator” (a.k.a. SVP), the state need not

provide a clinical diagnosis by a licensed psychiatrist or psychologist. Rather the opinion of a qualified criminal justice expert is sufficient (pp. 129–132): Appellant, Donald Robert Conklin, was accused of sexually abusing his daughter for a period of nearly three years. Conklin was found guilty in the Wayne County Court of Common Pleas of various offenses in connection with the abuse after his daughter testified that he began assaulting her when she was six years old and that his assaults included acts of forced intercourse. Thereafter, the Commonwealth determined that Conklin qualified as a sexually violent predator (SVP) subject to provisions contained in Megan’s Law II. The Pennsylvania Supreme Court granted Conklin’s petition for review to ascertain whether the Commonwealth had carried its burden of introducing the testimony of a “licensed psychiatrist, psychologist or criminal justice expert” when it offered the testimony of a social worker.

In March 2002, Conklin’s daughter informed her mother that Conklin had been sexually abusing her for approximately three years. Subsequently, Conklin was arrested and charged with a number of sexual offenses.

At trial, a jury convicted Conklin of numerous charges relating to the sexual abuse of his daughter. As a result, Conklin was required by Megan’s Law II to undergo an evaluation by the State Sexual Offender Assessment Board (the “Board”) to determine whether he was a sexually violent predator.

The assessment was completed by a licensed clinical social worker, David Humphreys, who was also a member of the Board. With his findings, Humphreys determined that Conklin’s mental condition increased the likelihood of recidivism. Following Humphreys’ assessment, the trial court

conducted an SVP hearing, at which Humphreys proffered expert testimony for the state. After considering Humphreys' testimony, the trial court concluded that Conklin should be classified as an SVP.

Conklin appealed to the Pennsylvania Superior Court, challenging Humphreys' qualifications as an expert. In an unpublished decision, the superior court affirmed both the Board and the trial court's determination that Conklin was an SVP. The superior court predicated its decision that Humphreys was qualified to perform SVP assessments and to testify to that effect on the undisputed fact that Humphreys was a criminal justice expert.

Conklin then appealed to the Pennsylvania Supreme Court, reprising his argument that only licensed psychiatrists or psychologists qualify to provide expert testimony as to mental abnormalities or personality disorders. Arguing that the terms "mental abnormality" and "personality disorder" constituted psychological terms of art, Conklin theorized that such terms could be used only by those parties licensed to practice psychiatry or psychology.

Responding to Conklin's contentions, the supreme court examined the qualifications of experts in the context of sexually violent crime. Specifically, the court questioned whether, in order to prove that a sex offender is an SVP, the Commonwealth must provide a clinical diagnosis by a licensed psychiatrist or psychologist, or whether the opinion of a qualified criminal justice expert suffices. Unmoved by Conklin's position, the court held that the opinion of a qualified criminal justice expert suffices to prove that a sex offender is an SVP and that the Commonwealth need not provide a clinical diagnosis by a licensed

psychiatrist or psychologist. While the authors do not necessarily disagree with this specific practice in its entirety, and each jurisdiction will have or create its own laws in relation to the issue, this case signals the recognition of a distinction between offender classifications and clinical diagnoses. It provides for expert testimony from criminologists in areas where the courts essentially invent or adopt terminology that requires definition and assessment by qualified professionals. And when treatment is not the goal, forensic mental health experts may not be the only behavioral scientists qualified to perform such assessments.

EQUIVOCAL FORENSIC ANALYSIS

The word equivocal refers to anything that can be interpreted in more than one way or to any interpretation that is questionable. As described in Turvey (2008a, p. 190), an “equivocal forensic analysis refers to a review of the entire body of evidence in a given case, questioning all related assumptions and conclusions.” This critical assessment of all case facts and evidence helps insulate the forensic analyst from investment in prior case theories. Equivocal forensic analysis is a necessary and useful tool in both investigative and forensic realms, especially in those cases in which the facts lend themselves to multiple conclusions. If the case at hand is referred to as rape, the forensic examiner critically reviews the evidence which is meant to establish rape, such as the crime scene evidence, the medical report, the sexual assault kit, and any victim statements; if the crime at hand is referred to as a homicide, the forensic examiner critically reviews the evidence which is meant to establish homicide,

such as the crime scene, the crime scene documentation, the autopsy report, and the autopsy photos. When the evidence supports initial conclusions, the forensic examiner may move forward with additional assessments; whenever there is a doubt, it must be noted and case theories stemming from such conclusions must be amended.

Engaging in this sort of assessment at the outset of any case in which conclusions are predicated on the quality of the work that has been done prior is necessary to avoid bias and to identify weak or nonexistent evidence. One of the authors (Petherick) was involved in a case of alleged stalking and harassment involving former domestic partners, one of whom was a male police officer. The female half of the dispute hired Dr. Petherick, as she was at the time a defendant facing serious criminal charges. She protested her innocence. Prior to Dr. Petherick's involvement in the case, there had been no attempt to investigate the charges against her; rather, the word of the alleged victim—in this case, the police officer was being taken essentially at face value as proof, along with that of a fellow officer for corroboration. Upon creating a basic timeline and a simple reconstruction of activities using the available record of events from witness statements, cell phone records, text messages, and emails, Dr. Petherick was able to establish the impossibility of the officer's claims. The officer had not only given false statements, but also had induced others to do so as well to back up his claims. This assessment was sent up through the police chain of command through the defendant's attorney, all criminal charges were dropped, and the officer was investigated for falsifying evidence and witness tampering.

Crime reconstruction/staged Crime Scene Determination

Crime reconstruction is the determination of the actions and events surrounding a crime (Chisum and Turvey, 2007). A simulated or staged crime scene is one in which the physical evidence has been purposefully altered by the offender to mislead authorities and misdirect any investigation (Turvey, 2008a). Establishing whether a crime scene has been staged requires expertise in crime reconstruction, which is a subspecialty of the forensic sciences. Staging is a possibility in every case. Therefore, in every case, this explanation must be considered and excluded before being entirely abandoned. When staging is found, it tends to strongly suggest an offender who would be considered a likely suspect; the motive (precautionary crime concealment) is to deflect or hamper law enforcement investigations. Consider the following excerpt related to crime reconstruction and crime scene staging from the Forensic Examination Report prepared by one of the authors (Turvey) in the criminal matter of *Mississippi v. Robert Grant* (2006) (Turvey, 2006): Conclusion #3: The simulated, or staged, crime scene is that in which evidence has been purposefully altered by an offender to mislead authorities and/or redirect the investigation (Turvey, 2002, p. 249). Often, it is the owners or occupants of a residence that stage crime scenes, in order to move investigators away from the obvious conclusion that they were in some manner responsible for the crime that was committed there.

The crime scene in this case was staged to appear as though the shooting death of Arthur Joshua occurred outside the residence. This is based on a careful consideration of the following inconsistencies in the evidence:

A. According to the report by Det. Kramer, he “discovered that the back porch light had been removed.” The light bulb was subsequently located near the back yard door by Capt. Rucker.

The removal of a porch light bulb by an offender is time-consuming and impractical. It is seen in movies and television but it is uncommon in actual break-ins, especially when the residents are known to be home.

The light bulb that was collected (Exhibit 8) is pictured in photo #337, covered by the grass. This would require someone placing the bulb into the grass and perhaps even combing grass over it. This is inconsistent with the bulb being dropped, tossed, or thrown. Again, this is time consuming, impractical, difficult to do in the dark, and serves no purpose to a potential home invader aside from increasing their risk of discovery by occupants.

The back porch light is clearly visible in place, in photo #339. This is inconsistent with the light having been removed in the first place and requires reconciliation with Det. Kramer’s statement in his report.

B. According to the statement by Terry Adams, the attacker with the gun “started to try to tie up my hand and that’s when my girlfriend and Skipper arrived back home and he broke out.” He does not indicate that he was fully

tied up, or that his hands were behind his back, or that he was on the floor at any time. According to his girlfriend, Tishma Peralta, she found Adams “on the floor with his hands tied behind his back.” She does not indicate what kind of material he was tied with or how he was able to get free.

There is no documentation of any binding materials found at the scene to confirm that Mr. Adams was tied up. There is no documentation of any ligature marks or other injuries to Mr. Adams’ wrists that would be present if his hands had indeed been bound behind his back. According to the Trace Evidence reports by the Mississippi Crime Laboratory dated June 13, 2005, Terry Adams is the only person in the residence who tested positive for gunshot residue, on his left palm.

C. Tishma Peralta claims to have seen two men invading the home. She states that one of them was wearing a white mask with big eyeholes through which she could see his black skin. Ultimately, she states that she sees “the other dude” “run out” after “busting out the back door.” This was accomplished, according to her statement, with some force and difficulty. This is when she claims to hear the final gunshot. It is unclear where the shooter is standing in her version of events (inside or outside the residence). Notably:

She does not describe the exit of the man wearing the white mask (Arthur Joshua).

If an assailant had to “bust out” or break out of the back door once he had already gained entry into the residence, this would indicate that it was closed and locked. It would certainly not be necessary to “bust out” of a door that one

had used to gain entry. This statement by Ms. Peralta precludes the use of the back door as a point of entry.

There is no documentation or indication that heavy force was used to break or “bust” the back door open from the inside. Upon close examination of photograph #53, the door appears to be undamaged from the inside.

D. Wesley Jerome Williams alleges that someone entered through the front door and then struck him twice in the head with a wooden 2×4 , telling him to get down on the floor. Only one injury was documented related to the attack on Mr. Williams—a minor reddening of the scalp in a single linear pattern consistent with at least one of the edges of the 2×4 (see photo # 56). The following inconsistencies are noted: There is only one minor injury to Mr. Williams’ forehead, and no other reported injuries to his body. There is an absence of swelling in the area of the injury, which would be expected with a heavy blow to the head using a 2×4 , and the passage of time. At least an hour, if not more, had passed before this photograph could have been taken. There is an absence of hemorrhage beneath the skin, which would be expected with a heavy blow to the head using a wooden 2×4 . On close inspection of the photograph, there is an absence of splinters transferred to Mr. Williams’ scalp, or injuries from splinters, which would be expected given the condition of the 2×4 and the severity of the blow.

E. Two bloody white masks were recovered from the scene. Tishma Peralta did not report seeing an assailant that wore two masks. She reported the intruder that she saw, up close, was wearing a white mask with big eyeholes. Only one assailant is known to have been injured in this case, and consequently only one

mask should have been found with blood on it. This inconsistent finding begs further examination and investigation.

F. Only some of the items allegedly taken from the safe and placed into the blue pillowcase have value to a thief (the cash, the marijuana, perhaps the pipe/papers, the coins, the wallet, and the GPS). However, the personal note, two drink coasters, a Crown Royale bag, a film container, and the set of glasses w/glass tray have no value on the street. Taking these items makes little or no sense from the perspective of profit.

It should be noted that the content of the Crown Royale bag is not documented. It should be noted that the content of the film container is not documented. It should be noted that there was apparently a white container recovered from the blue pillowcase with the contents undocumented.

G. The glass contents of the blue pillowcase were carefully wrapped with newspaper prior to being placed inside. The advertisements on the newspaper used to wrap these items are consistent with the advertisements on the newspaper from the table in the living room at the crime scene. This supports the conclusion that the items were carefully wrapped at the scene. This activity was not described by any of the witnesses interviewed in this case.

H. Tishma Peralta, Skipper, and Wesley Jerome Williams would have to be in the living room

when the shot that killed Arthur Joshua was fired, ricocheted off the front door, and landed on the couch. There is no documentation that any one of these three individuals suggested this event to investigators. This omission is a logical break in the known sequence of events and must be resolved.

I. The victim was shot through the lungs and trachea. His lungs would have collapsed and he would be spitting blood on the inside of his mask, making it difficult to stand, walk, or see. This makes an unassisted exit from the residence unlikely. His body would have to be carried or dragged from the inside of the residence to where it was ultimately found outside. In this case, after being confronted with the evidence from the Forensic Examination Report under cross-examination, Terry Wayne Adams confessed on the witness stand to staging numerous aspects of the crime scene. However, and despite an absence of direct physical evidence, Robert Barnes was convicted for an undisclosed and undefined role in the crime.

As is clear from this example, staging has both investigative and forensic applications. It can help narrow the suspect pool early on, limiting it to those who would be considered immediate suspects in the crime, and it may be admissible as a point of reconstruction in criminal and civil trials. This point will be expounded upon further in the case example at the end of the chapter.

Victim risk/exposure assessment as explained in Turvey (2008a, p. 378): “One of the many lenses that may be used to examine the victim-offender relationship is in terms of the exposure involved. Victim exposure is the amount of exposure to harmful elements experienced by the victim. It is determined by examining lifestyle exposure and situational exposure.” The forensic criminologist may conduct this type of assessment during investigations to help define and then narrow the suspect pool. In a criminal or civil proceeding, the forensic criminologist may testify regarding victim

exposure as part of a critique related to best investigative practices and suspect viability, or as part of an assessment related to premises liability issues.

Psychological autopsy

A psychological autopsy involves the evaluation of a decedent's mental state prior to death. When suicide is determined to be the manner of death, this assessment helps to clarify the factors that lead to the victim's taking his or her own life. When the manner of death is unclear, this assessment helps to weigh out existing evidence to determine which theories it favors, if any. As explained in LaFon (2008, p. 420):

There are two basic applications of the psychological autopsy: the suicide psychological autopsy (SPA) and the equivocal death psychological autopsy (EDPA) (La Fon, 1999). These applications both use a similar psychological autopsy procedure; however, each application's purpose or goal is very different. The first type of PA, the SPA, is conducted when the manner of death is unequivocally a suicide. The Centers for Disease Control (CDC) provides clear guidelines that establish suicide as the appropriate mode of death (Jobes et al., 1987). These guidelines classify a death as suicide based on the presence of self-inflicted injury evidence and an explicit/implicit intent to die.

The purpose of the suicide psychological autopsy (SPA) is to understand which psychosocial factors have contributed to the suicide. Suicidologists collect and database information from the SPA to better understand suicide causation for the purposes of intervention and prevention. There is no extended legal or forensic investigation following an SPA.

The second type of psychological autopsy application is the equivocal death psychological autopsy (EDPA). An equivocal death is any death in which the manner/mode of death—that is, the reason why the death occurred—is not immediately clear. Shneidman (1981) estimates that between 5% and 20% of all deaths are equivocal. The EDPA is a form of death investigation that must investigate alternative manners of death in an attempt to provide new information about the circumstances surrounding the death that can then be further investigated by the appropriate authorities (Spellman and Heyne, 1989). A psychological autopsy is performed during the investigative phase, ideally, to inform medicolegal determinations and help establish whether a crime has been committed.

However, it is also useful in legal proceedings, to help the trier of fact determine whether a crime has been committed (if a defendant is on trial for a homicide that may actually be a suicide), whether there may have been negligent care issues related to the victim's mental health (if he or she killed himself or herself while under the care of a mental health provider), or whether the death was accidental (as occurs in civil cases brought against insurance companies by plaintiffs who are denied death benefits from those who suffer autoerotic death). A psychological autopsy does not involve diagnostic or treatment goals. Rather the goals are solely investigative and forensic. As a consequence, one need not be a psychologist to render opinions related to the issue. However, one must have a strong psychology background and be fully educated as a behavioral scientist. Any criminologist performing a psychological autopsy without this background is often doing so from a place

of ignorance regarding the intersection of criminological theory, human behavior, and psychodynamics.

Motivational analysis

As explained in Turvey (2008a), motive is a function of the emotional, psychological, and material needs that impel and are satisfied by behavior. Intent, on the other hand, is the end aim that guides behavior. Motive is objectively established by examining known offender behavior and choice patterns before, during, and after the commission of a crime. The determination of motive helps with the following investigative and forensic ends (Turvey, 2008a, p. 274):

It reduces the suspect pool to those individuals with a particular motive. It assists with the investigative linkage of unsolved crime with a similar motive. Along with other class evidence (i.e., means, opportunity, associative evidence), motive can provide circumstantial bearing on offender identity.

Along with other contextual evidence, motive can provide circumstantial bearing on offender state of mind. Along with circumstantial evidence, motive can provide circumstantial bearing on whether a crime has actually occurred. This topic will be discussed further in Chapter 5.

Determination of torture

Forensic criminologists with education and training in crime reconstruction, wound pattern analysis, and psychodynamics can examine a case to determine whether torture is evident. That is to say, whether the offender intentionally inflicted pain on the victim for the sake of pleasure or revenge, or to gain information. This has investigative applications in that torture might be a part

of an offender's modus operandi or offense signature, and therefore it may be useful for case linkage purposes. However, in a criminal trial, the presence of torture may be an aggravating factor that a jury may consider when deliberating regarding the death penalty. Consider the following excerpt from a Forensic Examination Report by one of the authors (Turvey) in *California v. Jack Lewis* (2008), a death penalty case involving allegations of torture (Turvey, 2008c):
Conclusion 5: The crime scene behavior in this case is consistent with an anger motivation, and not consistent with torture.

According to Turvey (2002, p. 307) motives are the "emotional, psychological, and material needs that impel and are satisfied by behavior."

As described previously in this report, there are multiple behavioral indicators that are inconsistent with torture, such as the presence of lubrication, the consensual anal sex video, and the potentially short duration required to effect behaviors necessarily associated with the homicide. There is also evidence of mutual consensual anal penetration with the "Mag-Lite." This includes a lack of evidence of physical bindings; both victim and defendant excrement being present at the scene; and the mutual use of methamphetamine that intensifies the sex drive and lowers sexual inhibitions.

There is also no profit motivation evident in this case; the victim has no valuables and is essentially indigent. In point of fact, the victim is the primary source of money for the defendant (via her job and her family), but only so long as she remains alive.

Intense, directed rage is evidenced in this case by the combination of brutal force, lethal force, and overkill.

- Brutal and lethal force are evidenced in this case by the onset of multiple injuries that inflict tremendous damage until death results: this includes the cumulative blunt force trauma, the hair pulling, and the manual strangulation as previously described.
- Overkill is injury beyond that needed to cause victim death. The volume of blunt force trauma and injury associated with the manual strangulation evidences overkill in this case. As previously stated, the number of these injuries exceeds 100.

Unexplained behavior in this case includes the fact that at some point, the defendant or the victim smeared excrement on the floor and walls. This may be related to the anger motivation, or it may have been transferred incidentally. In any case, the presence of excrement is consistent with mutual anal penetration, as both victim and defendant DNA is present.

It is important to note that it is not generally possible to discriminate whether this level of rage is caused by real or perceived wrongs. In other words, the offender may have been agitated by an accumulation of actual events, a misinterpretation of actual events, or by imagined events. Consequently, crime scenes involving the following can be difficult to distinguish: domestic/intimate homicide; drug/alcohol related homicide; homicide committed by the mentally ill. In this particular case, the author was not allowed to offer a specific opinion regarding the presence of torture. However, the author was allowed to testify regarding other opinions, as well as the facts and circumstances that formed the basis for the opinion that torture was not clearly evident. Ultimately, 39-year-old Jack Henry Lewis was found guilty of the murder of 48-year-old Jan

Hasegawa (his longtime girlfriend) along with the special circumstance allegation that the murder involved torture. He had indeed killed her while both were high on methamphetamine, and this was never in dispute; their mutual addiction to the drug as well as its involvement in their sexual activity had an extensive history. However, the jury also found against the death penalty: Lewis received life in prison.

Criminal Profiling Criminal profiling involves the inference of offender characteristics (Turvey, 2008a). There are more than a few ways to make these inferences though not always with a high degree of reliability. Forensic criminologists, or profilers, can predict offender characteristics based on statistical models, prior research, or experience; they can use hard physical evidence to make deductions about physical characteristics; or they can use analytical logic, critical thinking, and the scientific method to make deductions about offender relational and psychological characteristics based on an analysis of crime scene behavior (Turvey, 2008a). Criminal profiling has utility during criminal investigations if it can reliably define and reduce the suspect pool. It also has some value at trial, as explained in Turvey (2008a, p. 558):

Criminal profiling and related techniques were developed as tools to be used in the investigative process to assist in the identification of suspects. There are also a number of useful forensic ends that they can serve that are not necessarily related to establishing offender identity. These include focusing the suspect pool, explaining behavioral evidence, case linkage, and assisting in the development of investigative strategies.

There is something further to be said for the potential use of criminal profiles as an ingredient to assist in educating the trier of fact as to the general type of offender that may be responsible for a particular crime. Criminal profiles may be a reasonable aid to the trier of fact, given two very important caveats. First, the court must understand, and be explicit in its instructions to the jury about, the limits of behavioral evidence as described in this work. Second, criminal profilers must not disregard these limits and intrude on the issue of guilt by giving opinions as to whether or not the accused fits a particular profile. As this suggests, for criminal profiling to be of use at trial, there must be no doubt about the profiler's knowledge and expertise, beyond merely working for a law enforcement agency and having a civil service job title. Moreover, profilers themselves must have a high capacity for ethical self-governance, a clear understanding of what the ultimate issues are, and a propensity for avoiding their violation.

Case linkage, or linkage analysis, is the process of determining whether there are discrete connections between two or more previously unrelated cases through crime scene analysis. This is accomplished through a careful examination of offender modus operandi² and signature aspects³ (Turvey, 2008a). Case linkage has investigative applications with respect to identifying the existence of potential serial offenders, as well as a possible suspect pool, and then allocating investigative resources appropriately. It also has forensic relevance because the court may allow testimony on case linkage issues for the purpose of demonstrating a common plan, scheme, or design in actual or alleged serial offenses, if the offenses are sufficiently similar.

Consider the following excerpt from a report by one of the authors (Turvey) in a criminal case in which linkage analysis was initially at issue. It involves the comparison of M.O. and signature behaviors in a child sexual homicide to a sexual assault on a teen, highlighting gross dissimilarities, in the case of *California v. Joseph Cordova* (Turvey, 2006b):

It is the opinion of this examiner that there is no behavioral evidence to support the conclusion that there is behavioral commonality or similarity between the 1979 sexual murder of [8-year-old] *Cannie Bullock* and the sexual assault of 12-year-old *Nina Sharp* in Lakewood, Colorado in 1992.

The basis for this opinion is the consideration of numerous significant behavioral dissimilarities, to include at least the following:

1. The 1992 sexual assault of *Nina Sharp* involved opportunity created by a position of trust—the defendant was babysitting the victim at the time of the incident.
2. The 1992 sexual assault of *Nina Sharp* involved fondling only; it did not involve sexual penetration of any kind.
3. The 1992 sexual assault of *Nina Sharp* did not involve strangulation.
4. The 1992 sexual assault of *Nina Sharp* did not involve blunt force trauma or other forms of physical violence.
5. The 1992 sexual assault of *Nina Sharp* involved bargaining behavior with the victim as opposed to the use of any force.
6. The 1992 sexual assault of *Nina Sharp* involved primarily reassurance-oriented behaviors and motives—that is to say that the sexual contact involved behaviors that are intended to restore self- confidence or self-worth. This low aggression and pseudo-foreplay-oriented behavior often suggests a lack of confidence and a sense of personal inadequacy (Turvey, 2002).
7. The 1992 sexual assault of *Nina Sharp* did not

result in a homicide. While case linkage efforts are primarily of value in criminal trials, they may also be a component of civil actions. One of the authors has worked many serial rape cases, and at least three in civil actions involving case linkage issues: the first involved multiple former employers suing an employer that they argued was a sexual predator, requiring a comparison of case similarities to determine if they had occurred and whether they were actually related; the second involved a single victim from many suing the property where her particular attack occurred, requiring an analysis of all cases to establish whether a common scheme or plan existed and what that meant; the last involved a civil commitment in which a man convicted of a rape was argued to have committed many more, requiring an analysis of all suspected cases to determine whether these could be introduced as evidence in a civil commitment hearing.

PRE-SENTENCE INVESTIGATIONS, EVALUATIONS, AND MITIGATION

In criminal trials, the prosecution and the defense employ forensic criminologists to help investigate, establish, and make recommendations regarding sentencing. This aids in helping to make a decision about punishment that is specific to the circumstances of the individual, as prescribed by law. Such investigations and evaluations are conducted at any time prior to sentencing, and may include what is referred to as mitigating evidence (evidence that tends to explain, contextualize, limit the culpability of, or even justify certain offense behavior). According to the Guidelines of the American Bar

Association (2003): Mitigation evidence includes, but is not limited to, compassionate factors stemming from the diverse frailties of humankind, the ability to make a positive adjustment to incarceration, the realities of incarceration and the actual meaning of a life sentence, capacity for redemption, remorse, execution impact, vulnerabilities related to mental health, explanations of patterns of behavior, negation of aggravating evidence regardless of its designation as an aggravating factor, positive acts or qualities, responsible conduct in other areas of life (e.g. employment, education, military service, as a family member), any evidence bearing on the degree of moral culpability, and any other reason for a sentence less than death.

In case of presentence Investigation report in non-death penalty cases, it can be noted as follows, U.S. Federal Judge Helen G. Berrigan explains that they are a vital part of determining an appropriate sentence when conducted by a qualified professional (2008, pp. 819–821): In noncapital cases, the jury determines guilt or innocence, and if the defendant is found guilty, the judge has the task of deciding the appropriate sentence. A judge does not, however, decide the penalty in a vacuum. In the federal system, a detailed Pre-Sentence Investigation report (“PSI”) is prepared in virtually all cases, including misdemeanors. The report is typically twenty or more pages long, single-spaced, and contains a comprehensive account of the defendant’s life history. Along with details of the offense and the defendant’s prior criminal record, it includes personal and family data, which discuss parents, siblings, their occupations and health, and their interactions with the defendant. The PSI recites the circumstances of the defendant’s upbringing, family support or lack

thereof, and updated information from family members interviewed. It incorporates the defendant's own marital and parental history and interviews with his or her spouse or former spouse and children. The report includes a section on the defendant's physical condition, which recites everything from childhood and adult illnesses and accidents to even current tattoos. It contains a section on mental and emotional health, setting forth any commitments, psychological treatments, or difficulties the defendant has had and a separate section on substance abuse, including what drugs the defendant has sampled or is addicted to, and what treatment programs, if any, he or she attended. After that, a section on education and vocational skills details school and college attendance, where and for how long, how successful, and occupational training, if any. The employment record follows, with job descriptions, how long each job lasted, the pay, and the reason for leaving the employment. This is followed by a financial condition section, which sets forth the defendant's assets and liabilities, including a credit report.

Finally, the report includes several pages of sentencing options, setting out the statutory ranges of imprisonment, supervised release, and fines, the availability of probation, the appropriateness of restitution, and the sentencing guideline ranges and possible reasons for departure upward or downward from those ranges. The report even includes a confidential and detailed sentencing recommendation from the probation officer.

The probation officers who prepare these reports are highly educated and trained. A minimum of a bachelor's degree is required with one year of experience in such fields as investigation, counseling and guidance of offenders

in community corrections, or the equivalent in a related field such as social work or psychology. The officers frequently have master's degrees in one of the related fields or a law degree. For example, in the Eastern District of Louisiana, the Chief Probation Officer has a law degree and worked for a child protection agency prior to becoming a federal probation officer and PSI writer. The Deputy Chief has a Master of Social Work degree and worked in a District Attorney's Office prior to coming to U.S. Probation, also working in the Pre-Sentence Report division. According to Van der Hoven (2006), the forensic criminologist is uniquely qualified to assist with the preparation of presentencing reports, offering the following discussion in which the behavioral sciences of criminology and psychology/psychiatry are distinguished, when compiling pre-sentence reports and testifying in court, there are certain limitations that should be taken into consideration. Criminologists are not trained to diagnose mental illnesses or personality deviations. They neither apply nor interpret personality tests, nor intelligence tests unless specifically trained as psychometrists. Diagnosis, as well as applying and interpreting psychometric tests, is the highly specialised and exclusive field of the psychiatrist and the clinical psychologist. Although personality deviations are the study field of criminologists, they are not trained to diagnose a person for instance as an Antisocial Personality or Psychopath, but they can describe the characteristics of such a person and indicate that the accused shows similar characteristics. Should a criminologist suspect that the accused may be suffering from a mental illness or personality disorder, it should be brought to the attention of the accused's legal representative, and a

psychiatric or psychological report requested before the commencement of the court hearing.

When the criminologist is required to write a pre-sentence report for the court regarding a dangerous criminal, the criminologist can indicate risk factors pointing to future violent behaviour. Criminologists cannot perform personality tests, but they can develop their own scales and models to identify risk factors which may indicate the individual's level of dangerousness. Criminologists should have sufficient knowledge to evaluate the offender and, on the basis of certain specific risk factors, to indicate whether the person poses a danger to society or not. The criminologist's prediction of dangerousness should be supported by an evaluation report from a psychiatrist or clinical psychologist.

While criminologists cannot give an opinion in court regarding the accused's mental capacity or accountability, they can give an opinion concerning the accused's blameworthiness based on mitigating and aggravating factors. When compiling a pre-sentence report, criminologists follow a holistic approach, taking all relevant factors into consideration which could have influenced the personality make-up of the individual and the development of violent tendencies. In order to obtain a complete picture, their reports should be complemented and supported by psychiatric and psychological reports. Ideally, a psychiatrist, a clinical psychologist, a criminologist and a social worker should work together as a team in high-profile cases when violent offenders who committed serious crimes, are on trial. Owing to their divergent and specialised training, each expert will approach the case from a different perspective as determined by their specific discipline. The psychologist focuses

on the psychological aspects of an individual, whereas the forensic criminologist has a holistic view and approaches the offender in his or her totality (Labuschagne 2003:5). The psychiatrist's main role is determining the criminal capacity of the accused before judgment. The forensic criminologist, in turn, can only consider the offender's moral blameworthiness after conviction, but before sentencing (Labuschagne 2003:5).

Pre-sentence reports compiled by all the above-mentioned experts can contribute to a complete and clearer picture of the offender as a person and the most appropriate sentence and treatment programme for rehabilitation purposes. As provided in Berrigan (2008), when forensic criminologists act as mitigation specialists, the criminal justice system benefits dramatically because they are better trained in the area than lawyers, they are generally less expensive than lawyers with a lower hourly rate, and they increase the speed at which information about the defendant is gathered and distributed by virtue of their insight into what to look for and how to best summarize it.

Police liability and use of Deadly Force Every time a police or corrections officer attempts to deal with a perceived threat, especially when deadly force is involved, there is the possibility of criminal and civil litigation. The officer may have violated the law; subsequently, criminal charges may be involved. The officer may have, through negligence and failure to follow established policies, wrongfully caused a death; subsequently a civil lawsuit may be filed by the decedent's estate. As explained in Anderson (1987, p. 14), specific to the issue of deadly force: "Several thousand cases are filed annually under the Civil Rights Act, which allege that units of local government acted negligently

in selection, training, or supervision of personnel or in the establishment of policies related to the use of deadly force.” Forensic criminologists who have conducted research in the area of law enforcement or corrections policies and procedures are well suited to the task of performing assessments on the issues of negligent training and supervision, negligent failure to investigate, negligent employment and retention, wrongful termination, false arrest, conditions of confinement, assault and battery, excessive force, and the appropriate use of deadly force. This is especially true for those without direct ties to law enforcement, and no residual loyalty to law enforcement culture as a whole, because bias is less of a factor. Unfortunately, it is the tendency of the prosecution to use law-enforcement-friendly experts whenever possible in relation to such questions. The court should be unwilling to let such testimony into the record without an external review from an unaffiliated expert, but unfortunately this is not always possible.

P R E M I S E S L I A B I L I T Y

Premises liability refers to a landowner’s duty to protect individuals from harm, including third-party assaults (La Fetra, 2006). When there is a negligent failure to prevent this kind of harm, by virtue of the fact that the property owner knew or should have known that danger was a possibility and did not take sufficient precautions against it, there is the potential for civil action. As explained in Kennedy (2006, p. 120):

Among the myriad duties of the modern security manager is the responsibility to limit an organization’s exposure to premises liability for negligent security.

As a result of the evolution of case law in the US and Commonwealth countries over the past three decades, landowners and landlords of all stripes may be legally liable should a passenger, customer, client, tenant, guest, or other category of visitor to the premises be assaulted while on property under their control. For example, merchants may be sued by a customer attacked in a store's restroom or car park. A hotel guest sexually assaulted in her room by a nighttime intruder may have a cause of action against hotel management. Students at a university, visitors to a corporate headquarters, and passengers of common carriers are increasingly looking to the courts to order compensation from the owners and managers of the property whereupon their injuries were sustained (Michael and Ellis, 2003). The actual perpetrators of these acts are unlikely targets of such lawsuits since their identities often remain unknown or they themselves are simply uncollectible. This leaves, of course, the third-party corporate entity which is often looked upon as a 'deep pockets' defendant. When there is a dispute regarding whether danger was either foreseeable or preventable by the property owner, forensic criminologists may be asked to perform assessments regarding the deterrability of the offender, or the security of the premises. These concepts will be discussed thoroughly in Chapter 7.

CASE STUDY OF ATTEMPTED HOMICIDE OF LINDA MORRISSET

Background

On the morning of Sept. 12, 1999, 48-year-old Linda Morrisset (a Certified Public Accountant) was found unconscious in her Camarillo, California home.



Her childcare provider and concerned neighbors discovered her in the hallway leading to her bedroom, after repeated attempts to get someone at the front door failed. She had suffered multiple blows to the head with a blunt force object and had bruises on her biceps. By some reports, she also had brain material oozing from her head and nose.

According to the victim, she was home with her 22-month-old son, Robbie, and her 9-year-old son, Max, at the time of the assault. Robbie was found sleeping in his crib, in his own room, when the victim was discovered.

Because of history and factual circumstances, law enforcement immediately focused their investigative attention on Linda Morrisset's ex-husband, Lee Mannheimer. Mr. Mannheimer is suing Linda Morrisset for her inculpatory statements to the police and media. Linda Morrisset has filed a counter suit for damages relating to her injuries sustained in the above-described attack.

Conclusions

After a careful examination of the case material described above, this examiner has reached the following conclusions:

Conclusion #1—The victim, Linda Morrisset, was at a low overall lifestyle and incident risk of

being the victim of a violent stranger crime.

Conclusion #2—The crime scene in this case appears staged to lead investigators to believe that a stranger entered the victim's house through the sliding glass door in her bedroom, and then assaulted the victim during the

course of a burglary. This suggests that the offender would be an obvious, immediate, and/or logical suspect to investigators.

Conclusion #3—The physical and behavioral crime scene evidence is most consistent with an anger/revenge motivation.

Conclusion #4—Consideration of Lee Mannheimer’s involvement in the assault on Linda Morrisset is more than reasonable. Failure to consider and investigate Lee Mannheimer’s involvement in the assault to the point of exclusion would represent a serious investigative shortcoming.

Reasoning for Conclusion #1

After examining the available victimology, it is the opinion of this examiner that the victim, Linda Morrisset, was at a low overall lifestyle and incident risk of being the victim of a violent stranger crime.

Victimology is the study of victims. Establishing the victimology in a particular case is a necessary part of determining the context of some crimes (Baeza and Turvey, 2000). Furthermore, it is generally accepted that a victim’s social, medical and mental health history can provide insight into the behavior/state of mind of an individual, focus further investigation, and produce clues that will aid in establishing the cause, manner, and circumstances of their demise (NMRP, 1999).

As discussed in Turvey (2002):

Victimology is first and foremost an investigative tool, providing context, connections, and investigative direction. In an unsolved case, where the offender is unknown, a thorough victimology defines the suspect pool. Their lifestyle in general and their activities in particular must be scrutinized in order

to determine who had access to them, what they had access to, how and when they gained and maintained access, and where the access occurred.

If we can understand how and why an offender has selected known victims, then we may also be able to establish a relational link of some kind between the victim(s) and that offender. These links may be geographical, work related, schedule oriented, school related, hobby related, or they may be otherwise acquainted. These links provide a suspect pool that includes those with knowledge of or

access to the linked areas.

Lifestyle risk, This term refers to the overall risk present by virtue of an individual's personality, and their personal, professional, and social environments. The belief is that certain circumstances, habits, or activities tend to increase the likelihood that an individual will suffer harm or loss (Turvey, 1999). By all accounts, Linda Morrisset was at a low overall lifestyle risk of being the victim of a violent stranger crime. This is given the following circumstances:

The available material does not suggest that the victim engaged in criminal activity. The available material does not suggest that the victim was routinely exposed to crime or those engaged in criminal activity. The available material does not suggest that the victim lived in a high crime area. The available material suggests that the victim lived in an area that could be described as rural. The available material does not suggest that the victim has a history of addiction to illegal or controlled mood-altering substances. The available material does not suggest that the victim has a history of mental disorder. The

available material does not suggest that the victim is prone to anger or aggressiveness. The available material does not suggest that the victim is prone to impulsivity.

Incident risk—This term is used to refer to the risk present at the time of the victim’s assault by virtue of her state of mind and hazards in her immediate environment. By all accounts, Linda Morrisset was at a low overall incident risk of being the victim of a violent stranger crime at the time of the assault. This given the following circumstances:

The victim was in her home at the time of the assault. The available material does not suggest that the victim lived in a high crime area. The available material suggests that the victim lived in an area that could be described as rural. The available investigative material does not suggest that there was a string of unsolved burglaries, burglary/rapes, burglary/ assaults, burglary/homicides, or burglary/rape-homicides occurring in the victim’s neighborhood at the time of the assault. The victim was not known to be using alcohol or medications at the time of the assault. As suggested by the witness statements, the victim was not known to be particularly agitated or distressed on the evening prior to the assault.

Reasoning for Conclusion #2

The term crime scene staging refers to the alteration or simulation of physical evidence at a location where a crime has occurred, or where a crime is alleged to have occurred, in order to mislead authorities and/or redirect their

investigation by attempting to simulate an offense, or event, that did not actually take place (Turvey, 2000).

After reviewing the available evidence, it is the opinion of this examiner that the crime scene in this case appears staged to lead investigators to believe that a stranger entered the victim's house through the sliding glass door in her bedroom, and then attacked the victim during the course of a burglary. This suggests that the offender would be an obvious, immediate, and/or logical suspect to investigators.

The basis for this opinion resides in the consideration of the following facts:

The available evidence indicates that there was no sign of forced entry. The victim's front door was reportedly locked when childcare provider Thelma Meeks arrived on the morning after the assault. Meeks noted that this was not a usual circumstance, as the door was usually unlocked when she arrived. This suggests the possibility that the offender locked the door prior to leaving the residence, after assaulting the victim. This possibility is further strengthened by the discovery of small amounts of blood transfer evidence in the entryway, inside of the front door area, suggesting the offender's presence there after the assault.

A locked front door at a crime scene could cause investigators to search for an alternate point of entry that was either forced or left open, thus ignoring potential transfer evidence at the true point of entry.

The initial crime scene presentation suggests that the apparent point of entry may have been the sliding glass door in the victim's master bedroom. The sliding glass door was reportedly open approximately two feet when first

discovered by Thelma Meeks and concerned neighbors. However, this may not be the true point of entry. A door or window intentionally left open by the offender open is a common feature of the staged crime scene (Turvey, 2000).

By all indications (state of dress; lay pattern on top of bed; evidence of reading material and glasses in victim's possession at time of assault) the victim was apparently laying on her unmade bed, fully clothed and reading prior to the assault. The available evidence provides that victim's glasses and reading material were discovered in or near the hallway area, near the area where the victim was found. It is not likely that the victim bothered to carry these items from the bed with her into the hallway once the assault began. However, it is more likely that the victim would have carried them

with her to answer the front door, or during some other normal, non-life threatening activity.

By all evidentiary indications (blood evidence; damage to the hallway floor; the final resting place of the victim; the absence of blood spatter elsewhere in the home; the absence of disturbed items elsewhere in the home) the assault started and ended in the hallway. It is possible that the victim answered the front door and was assaulted while retreating to the bedroom from perceived danger. It is not likely that the offender entered the lit master bedroom with a waking victim through the glass sliding door given the risk involved. However, if the offender had entered through the bedroom, the attack would most likely have occurred there. Moreover, if the victim were quick enough to elude an offender entering through the sliding glass door and succumbed to an attack in the hallway, she would most likely have left her glasses and reading material behind.

The available evidence indicates that 5 necklaces were taken from the jewelry cabinet in the victim's bedroom. The jewelry cabinet was left open, most likely to direct investigators to note the missing jewelry and infer a stranger burglary gone awry. However, many other jewelry items were left behind, and there is no evidence to suggest that any other items of value were removed from the residence (including TVs, computers, and the victim's purse, which was in plain view in the kitchen area).

By all accounts, it was the impression of investigators at the crime scene that it appeared to have been staged.

It should be noted that as this crime scene is consistent with having been staged, this suggests an offender who is concerned about concealing their relationship with the victim. In this examiner's study of staged crime scenes, all of the cases studied involved an offender and a victim with a prior family/intimate relationship (Turvey, 2000).

Reasoning for Conclusion #3

In an anger-retaliatory crime, a main goal of offense behavior is to service cumulative rage and aggression. The offender is retaliating against the victim for real or perceived wrongs, and their aggression can manifest itself in a wide range, from verbally abusive language to hyper-aggressed homicide with multiple collateral victims (Turvey, 2002). After reviewing the available evidence, it is the opinion of this examiner that the physical and behavioral crime scene evidence is most consistent with an anger-retaliatory motivation.

The basis for this opinion resides in the consideration of the following facts:

Multiple blows to the victim's head with a blunt object. These were repeated, powerful blows that crushed through the skull to the brain. These were not

intended merely to incapacitate, but to kill. This is inconsistent with an offender whose primary goal is to burglarize a residence for profit, barring a victim that is violently fighting back (the available evidence does not provide indications that the victim fought back or was hostile towards the offender to any great measure, though defensive injuries on her forearms indicate that she protected herself during the attack).

The available evidence indicates that the assault was immediate, overwhelming, and short lived. This is consistent with an anger- retaliatory motivation.

The available evidence indicates that no sexual activity or assault occurred in relation to the physical assault. This is inconsistent with an offender whose primary goal is sexually assault.

The available evidence indicates an overall absence of a profit motive in relation to the entry of the residence and the assault (many items of value in clear view left untouched TVs, computers, victim's purse, victim's jewelry, VCRs, etc.; residence not apparently ransacked for valuables; victim's vehicle Ford truck apparently untouched, left behind; victim's garage not breached—tools and other items of value left behind; victim's office building on property found locked and untouched numerous items of value not taken).

The available evidence indicates that the offender left almost immediately after the assault. From this we may infer that the offender left because their object had been achieved if they had other objects to achieve, there would certainly have been plenty of time. This is consistent with an anger- retaliatory motivation.

The investigators at the crime scene believed that this was an attempted homicide, as indicated by the charges listed on even their initial investigative reports.

Reasoning for Conclusion #4

After reviewing the available evidence, it is the opinion of this examiner that consideration of Lee Mannheimer's involvement in the assault on Linda Morrisset is more than reasonable. Failure to consider and investigate Lee Mannheimer's involvement in the assault to the point of exclusion would represent a serious investigative shortcoming.

The basis for this opinion resides in the consideration of the following facts:

The victim was at a low overall lifestyle and incident risk of being the victim of a violent stranger crime. This suggests that the most fruitful avenues of investigative effort would be an examination of suspects known to the victim.

The physical and behavioral crime scene evidence is most consistent with an anger-retaliatory motivation. The consideration of current and ex-spouse involvement in such crimes is all but dictated by anger-retaliatory motivated offenses.

The crime scene is consistent with having been staged, suggesting an offender intent on misdirecting the investigation because they would be an obvious, immediate, and/or logical suspect. Moreover, in this examiner's study of staged crime scenes, all of the cases studied involved at least one offender and at least one victim with a prior family/intimate relationship which the staging activity was meant to conceal (Turvey, 2000).

In 1993, there was a well-documented murder-for-hire plot to kill Linda Morrisset, which by all accounts was investigated and confirmed by the FBI and the Sacramento County Sheriff's Office. Those directly involved, including a business associate of Lee Mannheimer, claimed that Mr. Mannheimer paid them, and implicated Mr. Mannheimer as the chief instigator of the murder plot. This occurred just prior to the couple's divorce.

The circumstances of the victim's assault resemble the circumstances prescribed in the previously described murder-for-hire plot. Lee Mannheimer was reported to have given instructions that the victim was to be killed when she was at home, alone, when the kids were not present, and injuries were to be delivered to her head.

Law enforcement maintains a "hazard file" on Lee Mannheimer in relation to the above-mentioned

1993 murder-for-hire plot.

Linda Morrisset and Lee Mannheimer share custody of a then 9-year-old son, Max, over whom there have been continuous, intense and bitter disputes.

As laid out by the material provided to this examiner, the relationship between Linda Morrisset and Lee Mannheimer has been one of cumulative dissatisfaction and antagonism. This has continued since their divorce both interpersonally, and through issues relating to the joint custody of their son, Max.

Lee Mannheimer has admitted to previous incidents of physical violence towards Linda Morrisset.

Family members have stated that the 5 necklaces removed from the victim's residence in association with the assault were gifts from Lee Mannheimer. The available material does not indicate that Linda Morrisset ever had significant trouble, antagonism, or disputes with anyone in her life other than Lee Mannheimer.

The available material does not suggest that there is any definitive evidence excluding Lee Mannheimer as a suspect in this case. Brent e. turvey, ms When it comes to addressing investigative and legal questions, criminologists can perform many different tasks. They work with both criminal and civil cases in various jurisdictions with various goals. First and foremost, then, it is crucial

for forensic criminologists to understand the issues inherent in being involved in these systems, such as the differences between criminal and civil cases, the legal parties involved, reasonable doubt and the burden of proof, as well as the rights of those involved and the legal consequences.

Conclusion

Once these elements are understood, forensic criminologists can perform any number of different analyses for investigators and the court. Criminologists may advise on issues relating to custom, practice, and guidelines; offender classification; equivocal forensic analyses; determination of staging and crime reconstruction; victim risk and exposure; psychological autopsies; analysis of the motives involved; determination of whether torture was involved; criminal profiling; case linkage; presentence investigations, evaluations, and mitigation; police liability and the use of deadly force; and premises liability. Each of these roles (and any combination of them) requires a distinct skill set and constant consideration of the issues present. On the whole, forensic criminologists are charged with remaining objective and knowing their limits regardless of the role they may play.

CHAPTER FOUR



PRINCIPLES OF FORENSIC SCIENCE AND TYPES (CRIMINOLOGY)

The objective of this chapter is to provide readers with the basic tenets and core disciplinary relationships within Forensic Criminology: the scientific study of crime and criminals for the purposes of addressing investigative and legal issues. The vast majority of criminology literature is statistical and theoretical in nature. It deals with groups of offenders and broad crime theory as opposed to applied case examination. This textbook is intended to educate students in an applied fashion regarding the nature and extent of forensic casework that is supported by, dependent on, and interactive with research, theory, and knowledge derived from criminology. It is also intended to act as a preliminary guide for criminologist practitioners working with and within related criminal justice professions—particularly when they are involved with assisting investigations, administrative inquiries, legal proceedings or providing expert findings or testimony under oath. It is offered as an applied scientific sub discipline within the domain of general criminology, as well as a roadmap to the forensic realm for the uninitiated. Forensic criminology exists as a discipline within criminology separate from any legal system that may employ its practitioners. It is a science, it is a behavioral science, and it is a forensic

science. The underlying theories and methods are not meant to be constructs developed in the courts of law but rather in the courts of science (Thornton, 1994). Like any other scientific practice, it exists beyond legal or national borders as a realm unto itself as it must to be a true discipline. While the scope of its practice and admissibility by different courts around the world can and does vary, the core of forensic criminology and its best practices do not change. Forensic Criminology in general suffers from a number of ills that we have long observed and now recognize as both serious and pathological. First, we have observed that many criminologists no longer have a sense of where they came from, or why that is important (let alone that they are even criminologists). Second, we have observed that criminology has been conceptualized and presented at university in the same general fashion for at least 60 years, perhaps more, with few significant developments or advancements. Third, as already mentioned, criminology has an applied forensic component despite being taught in large numbers by non forensic theoretical social scientists. This means students get only a limited picture of criminology, and sometimes without the high standards and ethical mandates that forensic practice requires. We have also observed a level of forensic ignorance regarding the nature, extent, and implications of criminological research and opinions. That is, if the forensic component of criminology is acknowledged at all. The net result of these conditions at colleges and universities around the world is an ever-growing population of criminology graduates—whether they be police officers, forensic scientists, corrections

officers, paralegals, lawyers, or criminological experts— with little or no comprehension of their forensic roots, roles, responsibilities, and opportunities.

FORENSIC CRIMINOLOGY

Quis, quid, ubi, quibus auxiliis, cur, quomodo, quando? Offered at the beginning of *In the Tracks of Crime* by Henry T. F. Rhodes (1952) as the “Maxim of a Roman Jurist” It may be argued that forensic criminology first appeared in U.S. literature as scientific criminology in the book *Crime’s Nemesis* by Luke May, published in 1936. He referred to this work as the scientific detection of crime and criminals, coming from the combined perspectives of physical evidence analysis and criminal modus operandi analysis. May (1936) states (pp. vi-viii):

The successful criminologist has no illusions about himself, despite the superman that fiction depicts. He lays no claim to psychic powers or clairvoyance. And yet, he must be cleverer than the criminal. The criminologist often fights a battle of wits with diabolical cunning. His knowledge of life and men must be immense; his powers of logic and deduction, acutely developed. His must be a thirst for knowledge in every field... Modern crime detection methods and the marvelous developments in the scientific detective laboratories of today bring stupendous odds against the criminal.

WHEN SCIENCE BECOMES THE HANDMAIDEN OF THE CRIMINOLOGIST

It is the purpose of this book to reveal these methods, bring them into the light, criminology demands much... Much of this work, especially its application to

crime problems, is of necessity, for science has only recently become the handmaiden of the criminologist. Not surprisingly, this language is essentially an adaptation of the writings of Hans Gross, which had significant influence over May, and his holistic approach to forensic casework. The next major appearance of the concept occurred postcriminalistics, in the text *Expert Witnesses: Criminologists in the Courtroom*, published in 1987. The authors of this work come from an applied social science background: one is a professor of criminology with a Ph.D. in criminology, and one is a professor of criminal justice with a Ph.D. in sociology. Both are criminologists and both have confronted the issues of expert social science testimony in forensic casework. Their approach to criminology and expert witnessing takes a narrow but important perspective, leaving the investigative, physical evidence examination, and forensic mental health aspects entirely aside. They focused their treatment instead on criminology as it relates to “matters of policing, court processing, and prison treatment” (Anderson and Winfree, 1987, p. ix), where research, theoretical, and process-oriented expertise in criminology becomes important to legal questions and court proceedings, often in a civil context. They explain that (p. 13): The presence of criminologists in the court as expert witnesses offering testimony on a broad range of criminal justice practices and procedures, or criminological testimony in criminal trials, has included, and continues to include evidence provided by forensic criminologists trained in criminalistics... Experts are available for every imaginable type of physical evidence and are usually qualified as expert witnesses based on training and experience.

More recently, owing largely to the expansion of the academic field of criminal justice..., to the increased liability of actions of its criminal justice personnel..., and to social issues on key constitutional issues..., behavioral scientists and social scientists with criminological or criminal justice expertise have increasingly been asked to appear as expert witnesses.

The university-based criminologist, therefore, generally provides expert testimony based on research which transcends and precedes the events or matters before the court and which the expert applies to such matters. The authors of this earlier work provide deep and useful insight into the role of expert criminologists and social science testimony, which are important threads in the overall fabric of forensic criminology. Based on the long history of criminology, and the multidisciplinary literature cited thus far, the authors of this text define forensic criminology as the scientific study of crime and criminals for the purpose of addressing investigative and legal questions. This is very similar to the equally broad definition offered in van der Hoven (2006, p. 153): “Forensic criminology refers to the actions of a criminologist in collecting, analysing and presenting evidence in the interest of objective proceedings in the judicial process.” It is an applied subcategory of general criminology where the abstract and the theoretical meet the practical and the concrete. It involves the proficient, critical, and objective examination of criminal cases and related evidence, featuring the scientific method and subsequent evidentiary interpretations. While there are a number of forensic criminologists in private practice, this field also encompasses many forensic subdisciplines. In terms of forensic criminology practitioners (a.k.a. forensic criminologists), it

quickly becomes evident that there are generalists and there are specialists. As with any profession, the specialist is highly proficient and informed regarding a very restricted area of practice. Forensic criminology specialists might focus entirely on a single subject matter, such as police use of force, risk assessments, security, criminal profiling, threat assessment, presentencing assessments, or an area of physical evidence examination such as criminalistics. Forensic criminology generalists, on the other hand, have a broad spectrum of knowledge from multiple areas of study and will have multiple areas of expertise. They are fluent in the theory and application of a broad range of criminology subjects without necessarily knowing all there is to know about a given subdiscipline. There are also forensic criminology generalists with speciality areas of concentration—hybrids of a sort. While being knowledgeable about many areas in general, they have localized strengths by virtue of greater research, skill, or experience in particular areas over the course of their career. The distinction between generalist and specialist forensic practitioner is made clearer by a discussion provided in Chisum and Turvey (2007) regarding forensic scientists (pp. ix–x):

Forensic generalists and forensic specialists alike are a requirement for informed forensic case examination, laboratory testing, and crime reconstruction to occur. A forensic generalist is a particular kind of forensic scientist who is broadly educated and trained in a variety of forensic specialties. They are “big picture” people who can help reconstruct a crime from work performed with the assistance of other forensic scientists and then direct investigators to forensic specialists as needed. They are experts not in all areas,

but in the specific area of evidence interpretation. According to DeForest et al. (1983, p. 17),

Because of the depth and complexity of criminalistics, the need for specialists is inescapable. There can be serious problems, however, with overspecialization. Persons who have a working knowledge of a broad range of criminalistics problems and techniques are also necessary. These people are called generalists. The value of generalists lies in their ability to look at all of the aspects of a complex case and decide what needs to be done, which specialists should be involved, and in which order to carry out the required examinations.

Specialization occurs when a forensic scientist has been trained in a specific forensic subspecialty, such as an area of criminalistics, forensic toxicology, forensic pathology, or forensic anthropology. Specialists are an important part of forensic science casework, with an important role to fill. Traditionally, forensic specialists provide the bricks, and forensic generalists have traditionally provided the blueprints. The forensic generalist in criminology, therefore, understands that informed case analysis is the result of objectively examining a whole related system of evidence rather than a narrow, specialized portion. The forensic generalist considers the totality of the known physical and behavioral evidence and only then frames theories regarding the behavior and circumstances related to a crime. He or she is steered by good science and the scientific method, holding no investment in the outcome. The forensic generalist then tests those theories and the theories of others against the

evidence, using a framework of analytical logic and critical thinking to distinguish facts, assumptions, opinions, and inference.

In the past, the majority of forensic criminologists were government-employed civil servants like Hans Gross and August Vollmer—working for law enforcement, the courts, government agencies, or publicly funded crime labs adjunct to law enforcement. After retirement, there is every indication that the greater number had little option other than to live out their life on a government pension, or take up a second career in teaching or security work. There was, as previously mentioned, little perceived need, let alone funding, for independent forensic expertise of any kind. In many parts of the world, independent forensic expertise is still available only to those who can afford it. In many systems, such as Australia, Canada, and the United Kingdom, there is even a prevailing attitude that if forensic experts are good enough for the government, they are good enough for the defense. Hence, the defense bar does not often perceive the need to, nor can it often afford to, hire privately employed forensic examiners of any kind. This reality hides the quality of forensic examinations in such systems, as there is no real peer review of findings and subsequent criticisms: we simply have no impartial measure regarding the quality of forensic work being done when private examinations are not performed.

In the United States, however, this changed radically upon the Supreme Court decision in *Ake v. Oklahoma* (1985). This decision held that

This Court has long recognized that when a State brings its judicial power to bear on an indigent defendant in a criminal proceeding, it must take steps to assure that the defendant has a fair opportunity to present his defense. This elementary principle, grounded in significant part on the Fourteenth

Amendment's due process guarantee of fundamental fairness, derives from the belief that justice cannot be equal where, simply as a result of his poverty, a defendant is denied the opportunity to participate meaningfully in a judicial proceeding in which his liberty is at stake. In recognition of this right, this Court held almost 30 years ago that once a State offers to criminal defendants the opportunity to appeal their cases, it must provide a trial transcript to an indigent defendant if the transcript is necessary to a decision on the merits of the appeal. *Griffin v. Illinois*, 351 U.S. 12 (1956). Since then, this Court has held that an indigent defendant may not be required to pay a fee before filing a notice of appeal of his conviction, *Burns v. Ohio*, 360 U.S. 252 (1959), that an indigent defendant is entitled to the assistance of counsel at trial, *Gideon v. Wainwright*, 372 U.S. 335 (1963), and on his first direct appeal as of right, *Douglas v. California*, 372 U.S. 353 (1963), and that such assistance must be effective. See *Evitts v. Lucey*, 469 U.S. 387 (1985); *Strickland v. Washington*, 466 U.S. 668 (1984); *McMann v. Richardson*, 397 U.S. 759, 771, n. 14 (1970).³ Indeed, in *Little v. Streater*, 452 U.S. 1 (1981), we extended this principle of meaningful participation to a "quasi-criminal" proceeding and held that, in a paternity action, the State cannot deny the putative father blood grouping tests, if he cannot otherwise afford them. [470 U.S. 68, 77]

Meaningful access to justice has been the consistent theme of these cases. We recognized long ago that mere access to the courthouse doors does not by itself assure a proper functioning of the adversary process, and that a criminal trial is fundamentally unfair if the State proceeds against an indigent defendant without making certain that he has access to the raw materials integral to the building of an effective defense. Thus, while the Court has not held that a State

must purchase for the indigent defendant all the assistance that his wealthier counterpart might buy, see *Ross v. Moffitt*, 417 U.S. 600 (1974), it has often reaffirmed that fundamental fairness entitles indigent defendants to “an adequate opportunity to present their claims fairly within the adversary system,” *id.*, at 612. To implement this principle, we have focused on identifying the “basic tools of an adequate defense or appeal,” *Britt v. North Carolina*, 404 U.S. 226, 227 (1971), and we have required that such tools be provided to those defendants who cannot afford to pay for them.

To say that these basic tools must be provided is, of course, merely to begin our inquiry. This decision basically held that because the government has overwhelming access to manpower, money, and forensic experts, the defense must be given parity for the adversary system to function fairly. The ruling is of course an ideal. The reality is that not every lawyer and court understands and invokes *Ake* appropriately or consistently, as explained in Findley (2008, pp. 929–931):

[T]he government has significantly greater access to forensic science services and experts than do most criminal defendants. Crime laboratories exist to provide such services to prosecutors; no corresponding institutions exist for defendants. And, because most defendants are indigent, their ability to hire experts is dependent on public funding of legal services to the indigent, which is abysmally inadequate in virtually every jurisdiction. Because funding for indigent defense is so inadequate, defense services are rationed in ways that put innocents at risk; rationing disfavors expensive, substantive innocence claims (such as expensive litigation about the validity of forensic evidence), and instead favors more inexpensive procedural constitutional claims. While the

Supreme Court in *Ake v. Oklahoma* recognized a constitutional right to publicly funded experts for the indigent, exercise of that right is dependent on the willingness of a local judge to order the expenditure of scarce local resources, and on a cumbersome case-by-case, expert-by-expert process for requesting funding. Any risk of failure of that case-by-case process to provide adequate expert services falls on the defendant, and courts have tended to apply *Ake* narrowly.

That system comes nowhere close to providing the level of forensic sciences assistance that is needed, or that is available to the prosecution. In any case, the rendering of *Ake* changed the forensic realm in the United States dramatically by requiring the state to fund expert forensic analyses for indigent defendants. It increased the demand for independent forensic expertise of every relevant type, and directly acknowledged the legitimacy of private forensic practice as a necessary part of due process. Despite the majority of key historical figures in forensic criminology having already originated outside government employment, this was a major development because it enabled the number of private forensic practitioners, and private forensic labs, to increase beyond a select few. This reality was foreseen in Anderson and Winfree (1987) when they correctly recognized *Ake* as a “portent of things to come” (p. xx) with respect to the development of forensic criminology.

CHAPTER FIVE



EVIDENCE IN FORENSICS AND THE CHAIN OF EVIDENCE

The conundrum of a crime prosecution would not be completed without forensic science. Criminals can never be convicted without the use of forensic science unless an eyewitness is present. While detectives and law enforcement agencies are involved in the collecting of evidence, whether physical or digital, forensic science is responsible for the examination of that evidence in order to establish facts that are admissible in court.

Murderers, robbers, drug traffickers, and rapists would be free to wander in a world without forensic science.

A forensic scientist's role in a criminal investigation is critical since it entails the meticulous inspection of evidence while also ensuring that it is not tampered with. The investigation of a criminal act involves a wide group of forensic experts and forensic technologies.

Forensic pathologists, for example, are experts at performing autopsies to determine the cause of death. Through the investigation of body fluids and tissues, an autopsy can help determine the cause and manner of death. To identify suspects, forensic scientists examine physical evidence (fingerprints, blood, hair, etc.) obtained from the crime scene. In addition, forensic experts

utilize image manipulation technologies to track down offenders who have been evading the authorities for a long period. This program allows people to digitally age a photograph in order to see how the person would age.

CRIME SCENE

A crime is an act that warrants public condemnation and penalty, which is usually in the form of a fine or jail. A civil wrong (a tort) is a legal action brought against an individual that seeks compensation or reparation.

For an investigator to conclude that a specific person is responsible for a crime, they need to present physical evidence that brings the suspect to the crime of scene. The Ugandan Evidence Act provides that he who alleges must prove⁷ and reports from such investigations are used to do just that.

Physical evidence includes any and all objects that can prove whether or not a crime was committed, or that can link a crime to its victim or perpetrator. However, before physical evidence may be efficiently used to assist the investigator, it must first be recognized at the crime scene. The deluge of material would swiftly immobilize the laboratory facility if all natural and commercial things within a reasonable area of a crime were gathered so that the scientist could find major clues from them. Only when physical evidence is collected with a selectivity governed by the collector's comprehensive knowledge of the crime laboratory's methodologies, capabilities, and limitations can it attain its maximum usefulness in criminal investigations.⁸

⁷ See Section 101 of the Evidence Act, Cap 6, Laws of Uganda.

⁸ Saferstein, Richard., (2018) *Criminalistics: An introduction to forensic science*, 12th edition. Boston: Pearson Education, 330 Hudson Street, NY, NY 10013, p. 49

The beginning of forensic science is at the crime scene. No amount of advanced laboratory instrumentation or technical experience will be able to save the situation if the investigator is unable to distinguish physical evidence or appropriately preserve it for laboratory analysis. Any police agency, no matter how big or little, may learn how to perform a proper crime-scene search for tangible evidence. Police organizations can ensure competent performance at crime scenes with proper training. Many police departments have transferred this responsibility to a specialist team of technicians. The skills of crime-scene investigation, on the other hand, are not difficult to learn and are well within the grasp of the average police officer.

THE PROCEDURE OF OBTAINING INFORMATION FROM A CRIME SCENE

Securing the Crime scene

The first officer on the scene of a crime is in charge of maintaining and protecting the area to the greatest extent possible. The officer must maintain his or her vigilance and rely on his or her training to deal with any violent or dangerous situations. Any vehicles or people leaving the site should be noted in particular.

Of course, getting medical assistance for those who require it and apprehending the perpetrator should take precedence. However, considerable efforts must be made as soon as possible to remove all unauthorized personnel from the area. If medical aid is required, the officer should instruct medical personnel to approach the body in a circumspect manner to avoid disturbing evidence. The

first officer on the scene must assess the victim's condition and take notes on any statements made by the victim. This information should be added to the notes later.

As more officers arrive, procedures to quarantine the area are quickly taken. The perimeter should include the crime scene's centre, any avenues of entry or escape, and any areas where evidence may have been dumped or relocated. Unauthorized entrance to the area will be prevented by ropes or barricades, as well as strategically placed guards. Efforts must be made to identify all people on the site and to detain any potential suspects or witnesses who remain. Officers should also keep all unauthorized individuals away from the site. This includes the victim's relatives and friends, who should be treated with as much compassion as possible. Only the investigators assigned to the scene should be allowed in. Responding officers must keep meticulous records of everyone arrives and quits the site, as well as the time they do so.

Excluding unauthorized personnel can be more challenging than imagined at times. Higher-ranking police officers and members of the press, as well as emotionally charged neighbours and curious onlookers, pay close attention to violent crimes. Every person who visits the scene has the capacity to destroy physical evidence, even if they do so unintentionally. To maintain adequate control over the crime scene, the officer in charge must have the right to bar anyone from the area, including fellow officers who are not immediately involved in the processing or investigation. Experienced criminal detectives are always ready to tell horror stories about crime scenes when hordes of people trampled over the scene for one reason or another, rendering physical evidence

completely worthless. Securing and isolating the crime scene are crucial steps in an investigation, and a skilled and experienced crime-scene investigating team can accomplish these.

After the scene has been secured, the area is evaluated by a lead investigator. He or she identifies the scene's borders first, and then the perpetrator's path of entry and escape. Logic predicts that the crime-scene investigator will be the first to notice obvious elements of crime-scene evidence. These goods must be photographed and documented. The investigator next does an initial walk-through of the crime scene to obtain a better understanding of the issue and devise a strategy for thoroughly inspecting and documenting the whole crime scene.

Smoking, eating, drinking, and littering are all things that should never be done at a crime scene since they can change the scene. Unless there is a substantial threat to investigating officers or onlookers, no part of the scene, including a body at a death scene, should be moved or disturbed. Officers should also avoid changing the temperature at the site by modifying windows, doors, or the heating or air conditioning. In the event of a high-profile accident or shooting, officers should relocate the vehicles and not clear the roadway where the incident happened to let normal traffic to pass.

Recording findings

Investigators only have a limited amount of time to work on a crime scene while it is still undamaged. It is imperative that the opportunity to permanently document the scene in its original state not be missed. Such records will not

only be useful during the future investigation, but they will also be required for presentation at a trial in order to describe the crime scene's condition and outline the placement of physical evidence. The three ways for recording a crime scene are notes, photographs, and sketching. In an ideal world, all three should be used; nevertheless, human and financial constraints frequently prevent photography from being used at every crime scene. Departmental guidelines will create priorities for utilizing photography resources in certain cases. There is no reason, however, why sketches and notes should not be made at the crime scene.

T a k i n g N o t e s

The call to a crime-scene investigator to report to a scene starts the note-taking process. The notes should begin with the name of the person who contacted the investigator, the date and time of the interaction, and any preliminary information provided, such as the case number. The note taker should record the date and time of arrival, who is there, and the identity of any other personnel who are being contacted when the lead investigator arrives. If more staff are contacted, make a note of their names, titles, and arrival time. Investigators must retain meticulous records of all staff movements in and out of the scene, starting with an interview of the first responding officer to document his or her activities. It's also crucial to keep track of the responsibilities assigned to each team member, as well as the start and stop timings for scene processing.

The primary investigator conducts an initial walk-through before sketching, photographing, or searching the scene. The investigator should take notes on various features of the crime scene in its original state during this walk-through. For all circumstances, the layout of these notes should be consistent. The notes should be written in a bound notebook with ink (ideally black or blue). Most importantly, notes should be written at the time of the crime scene investigation, rather than being recollected later from memory. The team members indicate the location of all evidence and properly describe each item in their notes when a search for evidence is completed. If a victim is present at the scene of a homicide, the investigator should view and document the condition of the body before the medical examiner or coroner moves it. A victim's or suspect's preliminary identification should be documented.

Because detailed notes can be spoken far faster than they can be written audio-recording notes at a scene can be beneficial this may also free your hands to perform other things while taking notes. To record their notes, some investigators may employ digital voice recorders. These recordings are simple to upload to a computer, but they must be copied to a disk in order to be made available as a tangible copy. Another way to keep track of your notes is to narrate a video of the crime scene. This has the advantage of allowing you to take notes while also photographing. However, the video must be transcribed into a written document at some time.

Taking Photos and capturing videos

The absence of alteration is the most critical need for documenting a crime scene. Objects must not be moved until they have been photographed from all essential angles, unless there are injured individuals involved. The images may not be admitted as evidence at a trial if objects are deleted, placements are changed, or items are added, and their intended value is lost. The fact that evidence was moved or removed prior to photography should be stated in the report, but the evidence should not be reintroduced into the scene to take images.

The ability to demonstrate the structure of the scene the location of evidence to be collected, and the relationship of things at the scene to one another makes crime-scene images extremely valuable. Photographs shot from various angles can reveal victims', suspects', or witnesses' possible lines of sight. For subsequent study, investigators must have a detailed description of the scene. Photographing biological evidence in its original state is also vital, as this type of evidence is frequently affected during examination. Photographs, on the other hand, cannot stand alone and must be used in conjunction with notes and sketches.

Because of the nature of digital photographs, forensic science casework exposes digital photography to significant criticism. Because the images are digital, computer software may readily edit them. This manipulation goes beyond simple photo enhancements like brightness and contrast adjustments or colour balancing. This is a serious concern because the fundamental purpose of

crime-scene photography is to provide an accurate depiction. Many governments develop criteria for identifying the situations under which digital photography may be utilized, as well as design and enforce tight protocols for image security and chain of custody, to ensure that their digital photos are admissible.

Every crime scene should be captured in its entirety. This means that the crime scene should encompass the location of the crime as well as any nearby places where significant events occurred shortly before or after the crime. From various perspectives, overview shots of the entire scene and surrounding region, including points of exit and entry, must be captured. If the incident occurred inside, a photograph of the entire room should be taken to demonstrate each wall area. Rooms close to the crime scene must be photographed in the same way. If there is a body at the crime scene, photographs of the body's position and placement in relation to the rest of the scene must be obtained. Close-up images of injuries and weapons found near the body are also required. The surface beneath the body should be photographed once the body has been removed from the scene.

Physical evidence is photographed as it is discovered to indicate its position and location in relation to the full scene. Close-ups should be taken after these overviews to document the features of the object itself. A ruler or other measuring scale may be inserted near the object and included in the shot as a point of reference when the size of the item is significant. A crime scene must have at least four photographs: an overview, a medium-range shot, a close-up photograph, and a close-up photograph with a scale. These images provide a

sufficient visual record of an item of evidence's location and appearance at a crime scene.

Because the cost of this equipment is reducing, the use of digital video at crime scenes is becoming more popular. Digital video follows the same concepts as crime-scene photography. Digital video, like traditional photography, should capture the overall scene as well as the immediate surroundings. Long shots and close-ups should both be taken slowly and methodically. In addition, having one crime-scene investigator narrate the events and scenes being recorded while another handles the shooting is preferable.

Videos of crime scenes, on the other hand, have significant drawbacks. First, despite the fact that some cameras offer image stabilization, most cameras will wobble throughout filming. Zooming and panning can also be sloppy; these methods should be employed only on rare occasions and at a very slow pace. Noise from the wind or other investigators can obstruct narrative or be improper and harmful. Investigators may stumble over phrases due to the “on-the-spot” nature of the narration, which can be confusing when a video is utilized in court. To avoid this, some

investigators film the footage with the sound turned off and later add comments on top of it.

Still photographs captured on videotape are often of lower quality than those captured with a digital camera. Although video may easily capture the sounds and scenes of the crime scene, it cannot be used to replace still photography at this time. For the human eye, the still photograph remains unequalled in terms of defining details. In some cases, digital video may be preferable to still

photography. Modern video cameras, for example, allow the user to review recordings of a situation and ensure that they are comprehensive. Furthermore, many video cameras can take still photos, or stills can be made from a computer disc. Video is a hybrid of notes and photos.

Drawing of sketches

The crime-scene investigator sketches the area after taking images. In the legal investigation of a crime, the drawing serves numerous vital tasks. A sketch can clearly demonstrate the arrangement of an interior or outdoor crime scene, as well as the relationship in space of all the materials and characteristics important to the investigation, if it is done correctly. Sketches are very useful for illustrating the location of gathered evidence. A decent drawing can be used to speculate on possible entry, departure, and movement patterns through the scene.

The investigator may not have the ability or time to create a detailed sketch of the scene. During the early stages of the study, however, this is not essential. A rough sketch providing an accurate description of the scene's dimensions as well as the position of all objects relevant to the case is required. This can be accomplished with the help of a drawing kit.

All retrieved physical evidence, as well as other relevant characteristics of the crime scene, are shown in a crude drawing. Objects are located in the sketch by measuring the distance between two fixed points, such as the room's walls. The distances depicted on the sketch must be exact, not a guess or an estimate. As a result, a tape measure is used for all measurements. Assigning a number or

letter to an item in a sketch is the simplest approach to identify it. The letter is then linked to the item's description via a legend or list placed beneath the sketch. A compass direction indicating north, as well as a title block indicating the location of the crime scene and any case information, should be included in the sketch.

The finished sketch, unlike the rough sketch, is produced with care and attention to aesthetic appearance. In order to be admissible evidence in a courtroom, the finished sketch must represent the information included in the rough sketch. To rebuild crime scenes from crude sketches, computer-aided drafting (CAD) has become the norm. Pre-drawn intersections and roadways, as well as buildings and rooms, are included in the software, which ranges from simple, low-cost programs to complicated, high-cost systems. A large symbol library offers the operator with a wide range of graphics that can be utilized to add fine details to a crime scene drawing, such as blood spatters. Computerized sketching can focus on a single area for a more detailed picture thanks to its zoom function. The operator can choose the scale size in CAD programs so that the final output can be produced in a size suited for courtroom presentation.

Searching for evidence from the scene of crime

A careful and systematic search for tangible evidence at a crime scene is required. The investigator, based on his or her knowledge and experience, must not miss any relevant evidence in order to recreate the crime in a true and fair manner. Even if suspects are apprehended right away and the intentions and

circumstances of the crime are obvious, a comprehensive search for tangible evidence must be carried out right away. Failure to do so, even if it appears to be unneeded, might lead to claims of negligence or accusations that the investigating agency wilfully "hid" evidence that would be damaging to its case.

The investigator in charge is in charge of assigning people who are responsible for searching a crime scene. A forensic scientist's aid at the crime scene is usually not required, unless in big crimes or when the evidence is complex; his or her duty begins after the evidence is submitted to the crime laboratory. Some police departments have trained field evidence technicians to search for physical evidence at crime scenes, as has already been mentioned. They have the tools and expertise to photograph the crime scene and inspect it for fingerprints, footprints, tool marks, or any other form of evidence that might be pertinent to the case.

The location and size of the area, as well as the behaviours of the suspect and victim at the site, will determine how a crime scene search is conducted. When feasible, have one individual supervise and coordinate the evidence collection. Without effective control, the search may take place in a state of confusion, resulting in unnecessary duplication of effort.

There are mainly five methods of searching for physical evidence on a scene of crime; strip or line search method; grid search pattern; spiral search method; wheel or ray search method and; quadrant or zone search method.

One or two investigators start at one end of the scene's boundaries and walk straight across to the

other side using the line or strip method. They then proceed a short distance along the border before

returning to the opposite side. Because the borders influence the beginning and end of the search lines, this strategy works best in settings where the boundaries are well defined. Important evidence may go undiscovered outside the search region if the border is chosen wrongly.

Two persons do line searches that originate from nearby corners and generate perpendicular lines in the grid approach. This method is quite thorough, but it requires that the limits be clearly defined before it can be used.

One person is normally involved in the spiral search pattern. The investigator proceeds in an inner spiral from the scene's boundary to its centre, or outward spiral from the scene's centre to its boundary. Because the searcher is travelling from a light containing evidence to an area where further evidence is most likely to be found, the inward spiral strategy is beneficial. The searcher can quickly detect footprints leading away from the site in any direction using either spiral strategy. However, perfecting a spiral is often difficult, and evidence may be overlooked.

The wheel or ray approach involves multiple persons going straight from the scene's boundary to the scene's centre (inward) or straight from the scene's centre to the scene's boundary (outward) (outward). Because the areas between the "rays" are not searched, this strategy is not recommended.

The quadrant or zone approach splits the scene into zones or quadrants, with team members allocated to each region for search. Each of these areas can be broken into smaller portions for more thorough searching by smaller groups.



This strategy is appropriate for situations with a vast area to cover. All possible points of entry and exit used by the criminals should be searched.

The type of evidence to look for will be decided by the circumstances of the crime. The ability of crime-scene investigators to recognize evidence and look for relevant places is obviously critical to the proper processing of the crime scene. Although training will provide general understanding for performing a competent crime-scene investigation, the investigator must ultimately rely on experience gathered from a variety of investigations to develop a successful plan for recovering pertinent physical evidence.

In a homicide investigation, for example, the focus will be on the weapon and any evidence left behind as a result of interaction between the victim and the assailant. Cross-transfer of evidence, including as hairs, fibres, and blood, between criminals is especially useful for linking suspects to the crime scene and correlating events that occurred during the commission of the crime. Attempts will be made to locate tool marks at the place of entry during a burglary investigation. Most crimes necessitate a comprehensive and methodical search for latent fingerprints.

Vehicle searches must be meticulously planned and carried out in a systematic manner. The extent to which the search must be detailed is determined on the nature of the case. In hit-and-run situations, the car's exterior and undercarriage must be thoroughly scrutinized. Blood, tissue, hair, fibres, and fabric impressions are all examples of evidence that can be found as a result of a cross-transfer of evidence between the car and the victim. On the victim, there may be traces of paint or shattered glass. In homicide, burglary, kidnapping,

and other crimes, all regions of the vehicle, both inside and out, are thoroughly inspected for physical evidence.

Handling and Extracting Evidence

Massive things to minuscule traces can all be used as physical evidence. Many pieces of evidence are obvious in their appearance, but others can only be found through a crime lab analysis. For example, minute amounts of blood on garments may only be identified after a comprehensive laboratory search, and the presence of hairs and fibres in vacuum sweepings or on garments may only be revealed after rigorous laboratory analysis. As a result, in addition to more obvious materials, it's critical to collect prospective carriers of trace evidence. As a result, it may be necessary to seize all of the clothing worn by the criminals.

To avoid the loss of trace components, each piece of clothing should be treated with care and packed separately. Vacuum critical portions of the crime scene and send the sweepings to the lab for analysis. Different locations' sweepings must be gathered and packaged individually. This can be accomplished with a handheld vacuum cleaner fitted with a particular filter attachment. Furthermore, fingernail scrapings from people who came into contact with other people may contain minute shards of evidence that can be used to link the aggressor and the victim. To prevent injuring the skin, scrape the underside of each nail with a dull item like a toothpick. These scrapings will be examined under a microscope in the laboratory.

The search for physical evidence must go beyond the crime scene to a deceased victim's autopsy room. The medical examiner or coroner examines the victim thoroughly to determine the cause and manner of death. Tissues and organs are routinely kept for pathological and toxicological testing. Simultaneously, preparations must be made between the examiner and the investigator to retrieve a variety of objects from the body for laboratory investigation.

Between the moment the evidence is removed from the crime scene and the time it is received by the crime laboratory, investigators must handle and process physical evidence in a way that prevents any modification. Contamination, breakage, evaporation, unintentional scratching or bending, and incorrect or negligent packaging can all cause changes. When handling evidence, latex gloves or disposable forceps are frequently used to avoid difficulties. Between collecting each item of evidence, all non-disposable equipment should be cleaned and/or sanitized. Evidence should not be moved until investigators have taken notes, sketches, and photographs of its location and appearance.

The best way to preserve the integrity of evidence is to keep it in the same state as it was found at the crime scene. When possible, evidence should be submitted to the laboratory in its original state. Blood, hairs, fibres, soil particles, and other sorts of trace evidence should not be removed from garments, weapons, or other items that bear them. Instead, he or she should send the entire thing to be processed in a laboratory.

If evidence is clinging to an object in a risky way, prudent judgment mandates that it be removed and packaged. When dealing with evidence stuck to a major

structure, such as a door, wall, or floor, use caution and a forceps or other appropriate equipment to extract the specimen. When dealing with a bloodstain, you can either scrape it off the surface, transfer it to a wet swab, or cut out the stained part of the object.

A well-prepared evidence collector arrives at a crime scene with a big supply of packaging materials and instruments, ready to deal with any eventuality. To pick up small items, forceps and similar equipment can be employed. Hairs, glass, fibres, and other small or trace evidence can be safely stored in unbreakable plastic pill bottles with pressure caps. For most trace evidence found at crime scenes, manila envelopes, screw-cap glass vials, sealable plastic bags, or metal pillboxes are appropriate containers. To prevent the evaporation of volatile petroleum remnants, charred material retrieved from a suspicious fire must be stored in an airtight container. In such cases, new paint cans or firmly sealed jars are recommended.

Ordinary postal envelopes should not be used as evidence containers because powders and small particles will seep from their corners. Small amounts of trace evidence, on the other hand, can be easily wrapped in a skilfully folded piece of paper known as a "druggist fold." Fold one-third of one end of the paper over, then the other (one-third) over that, and repeat from the other two sides. Tuck the outside two ends of the folded paper into each other to create a tight container that stops the specimen from spilling out.



Maintaining a record of people who handled the evidence

When evidence is produced in court as an exhibit, the chain of custody, or continuity of possession, must be established. The best guarantee that the evidence will withstand inquiries into what happened to it from the time of its discovery to its presentation in court is to follow standard procedures in recording the location of evidence, marking it for identification, and properly completing evidence submission forms for laboratory analysis. This means that everyone involved in handling or examining the evidence must be identified. Failure to authenticate the evidence's chain of custody could raise major concerns about the evidence's legitimacy and integrity, as well as examinations of it.

When retrieving physical evidence at a crime scene, all things should be carefully wrapped and tagged. This should be done with extreme caution to prevent ruining their evidence value or limiting the number and kind of examinations the criminalist can do on them. If at all feasible, the evidence should be labelled so that it can be identified. The collector's initials and the date of acquisition are usually inscribed directly on the item. If the evidence collector is unsure whether or not to mark the item or where to mark it, he or she should skip this step. Once an evidence container, such as a box, bag, vial, or can, has been chosen, it must be labelled for identification. The evidence collector usually fills out a pre-printed identification form found in the evidence container. Otherwise, the collector must tag the container with an evidence tag. On the evidence tape seal, the investigator who packaged the

evidence must write his or her initials and the date. If feasible, anyone removing evidence for subsequent testing or observation should endeavour to avoid breaking the original seal so that the information on the seal is not lost. On the new seal, the person who reseals the packaging should write his or her initials and the date.

A basic chain-of-custody document would include the collector's initials, the evidence's location, and the date of collection. This transfer must be documented in notes and other appropriate forms if the evidence is given to another person for care or delivery to the laboratory. In fact, everybody in possession of the evidence is required to keep a written record of its acquisition and disposition. All personnel involved in the collecting and transfer of evidence are frequently called to testify in court. The chain of custody should be kept to a minimum to minimize confusion and to maintain total control of the evidence at all times.

Recovery of matching samples

When examining evidence, whether it's soil, blood, glass, hair, fibres, or other materials, it's common to compare it to a known standard or reference sample. Although most investigators have minimal trouble identifying and collecting important crime-scene evidence, few seem to realize the value of delivering a full sampling of standard/reference materials to the crime lab. The victim, a suspect, or other known sources may provide such information. For example, a hit-and-run inquiry may need the removal of standard/reference paint from a suspect car. This will allow it to be compared to the paint found at the crime site. Hair obtained at a crime scene will be of maximum value only when compared to standard/reference hairs taken from the suspect and victim.

Similarly, bloodstained evidence must be accompanied by a standard/reference buccal swab sample acquired from all relevant crime-scene participants. The evidential value of crime scene evidence is often determined by the quality and quantity of standard/reference specimens, and these standard/reference specimens must be treated with similar care.

Some sorts of evidence require the gathering of substrate controls as well. These are materials found at or adjacent to areas where tangible evidence has been left. Substrate controls, for example, are typically collected at arson scenes. If an investigator suspects a surface has been exposed to gasoline or another accelerant, he or she should also collect a piece of the same surface material that is not suspected of having been exposed to the accelerant. The substrate control is examined in the laboratory to confirm that the surface on which the accelerant was applied does not interfere with the testing methods. A substance on which a bloodstain has been deposited is another common example of a substrate control. Unstained areas near the stain may be sampled to see if this material may affect the interpretation of laboratory results.

The Laboratory

In most cases, evidence is delivered to the laboratory in person or sent via mail. The distance the submitting agency must travel to the laboratory and the urgency of the case dictate the manner of transmittal. If the evidence is provided personally, the deliverer should be familiar with the case to help laboratory workers and the deliverer discuss specific parts of the case.

When sending evidence to a laboratory, an evidence submission form must be included with each piece of evidence. This form must be completely filled out. Its contents will allow the laboratory analyst to conduct a thorough and

knowledgeable evaluation of the evidence. A brief summary of the case history should be provided to the laboratory with special care. This information will allow the examiner to examine the specimens in a logical order and make the appropriate comparisons, as well as make the search for trace amounts of evidence easier.

The particular kind of examination requested for each type of evidence is to be delineated, the analyst, on the other hand, will not be obligated to do all of the tests that the investigator has ordered. As the investigation progresses, additional evidence may be discovered, and the case's complexity may shift. Furthermore, the analyst may discover that the initial requests are incomplete or unrelated to the case. Finally, the evidence submission form must include a list of the objects that have been submitted for examination. Each item must be packaged separately and given a number or letter, which must be listed on the form in a logical and organized manner.

Legal Considerations

Perhaps no experience in police service is more aggravating or depressing than seeing valuable evidence being withheld from use against the accused due to legal issues. This predicament usually develops as a result of an allegedly illegal search and seizure of evidence. As a result, any evidence removed from a person or the scene of a crime must be done in accordance with Ugandan laws. The person's right to privacy must not be unjustifiably limited or violated in the quest to obtain a certain piece of evidence. In order to gain entry to the suspect's premises or working space, the person entrusted with conducting the search must follow the required legal procedures to acquire a search warrant.

Failure to follow the rules could result in the loss of potentially useful evidence.⁹

Evidence means the information, fact whether general or legal about the issue in case provided by person which may be normal citizen or well qualified authority including “Medical Practitioner” and presented to the court of law.

OR all legal means (material, information or statement) presented in court of law during judicial hearing to prove or disprove an allegation. The Admissibility of evidence means principles for the production of evidence.

MAJOR PRINCIPLES OF EVIDENCE COLLECTION

- i. The evidence must be confined to matter in issue.
- ii. The evidence must be clear, concise and relevant.
- iii. The evidence must be given in oral form or in written form.
- iv. The evidence must be based on truth and honesty and should not breach any code of conduct.
- iv. The evidence must be simple in description and not doubtful.
- vi. Hear say evidence is not admissible except during dying declaration.

TYPES OF EVIDENCES

The following are the types of evidence presented to the court of law by a witness.

- ❖ Direct evidence.
- ❖ Circumstantial evidence.
- ❖ Opinion of an expert.
- ❖ Trace evidence.

⁹ See Monitor Publications Ltd v Attorney General, Civil Suit No. 747 of 2013

1. Direct Evidence

It means that the person has perceived the evidence directly through his/her own senses. The direct evidence may be. a) Oral evidence. b) Documentary evidence e.g. Medical certificate, Medical legal report, dying declaration.

Example

- ❖ The witness has perceived the scene of accident directly by his/her own senses.
- ❖ The witness has seen the act of “Qatl” directly.

2. Circumstantial Evidence

It means the fact from which another fact can be inferred. OR The fact, which can be known from

the study of circumstance or the scene of offence

Example When the dead body is lying dead on the road and near it are some broken pieces of windscreens and tyre marks these visible facts offer circumstantial evidence.

3. Opinion of an expert

It means the conclusion or the legal information given by the qualified authority such as medical practitioner. ii. The opinion of an expert is of important value and may prove or disprove an allegation. iii. Medical opinion about the weapon of offence, duration of injury and cause of injury or death are important.

4. Trace Evidence

It is a material left at the scene of crime during performance of an act. The transfer of trace evidence is a mutual/ two-way phenomenon. Example Biological Evidence e.g. Blood, saliva, semen, nails, hairs, vomitus, teeth marks, fingerprints etc. Non-biological Evidence e.g. wristwatch, neckles, breslet, clothes, keys etc.

RECORDING OF EVIDENCE IN FORENSIC SCIENCE

During the trial of a case, the evidence in the court of law is recorded in three basic ways.

- ❖ Examination is chief.
- ❖ Cross Examination.
- ❖ Re- Examination

1. Examination is chief.

This is the 1st component of evidence and party who produces the witness in the court of law conducts it. ii. The witness is asked by the advocate of party who causes the witness in the court. iii. During this stage the witness must recall the evidence and facts should be in his/her mind. iv. Leading questions are not allowed except in those cases in which the judge is satisfied that witness is hostile. v. The objective of this examination is to lay before the court the facts, which the witness knows about the case.

2. Cross Examination.

- i. This is the 2nd component of recording stage of evidence.
- ii. The witness is asked by the advocate of party who defends the offences presented in the case.
- iii. During this stage the advocate of opposite party asks question regarding evidence in order to seek any benefit of plead.
- iv. Leading questions are allowed.
- v. The objective of this examination is to check the creditability of witness and accuracy of evidence.

3. Re-Examination.

- This is the 3rd stage of recording of evidence.
- ii. This stage provides an opportunity to clear any doubt, which is produced during cross- examination.
 - iii. This stage is also conducted to check the creditability of evidence provided by the witness.
 - iv. The court may ask question during any stage of examination to clarify the facts.

Principles of a Dying Deposition and Dying Declaration

Presence of accused is not necessary

It is not an oath

It is always taken down in writing

It may be verbal or written

A justice of peace can only record it

It can be recorded by any credible person even the attending Medical practitioner. Leading questions are allowed Not so It has legal values even if

the victim survives It has no legal value if the victim survives It can be taken in any case when the witness is critically ill It must be taken in criminal case of homicide

Deposition

It is a statement on oath made by a person suffering from serious disease to a magistrate in the presence of accused and his lawyers who has the opportunity of cross-examining him. ii. The doctor should satisfy that the victim is in sound mental condition. iii. Dying deposition legally carries more weight than dying declaration because it is recorded by magistrate in the presence of accused and his lawyers. iv. In contrast to dying declaration, dying deposition retains its full legal value if the victim survives.

WITNESS

The witness is the person who comes before the court of law and gives legal or general information

about the facts in the issue of case. The witness gives his/her opinion about the case and may prove beneficial.

The following are the main principles necessary for the person who is called as witness.

- i. Be familiar with the case for which he/she is called.
- ii. Speak briefly, carefully and in non-technical language.
- iii. Listen carefully when questioned before giving answers.
- iv. Address the court of a justice as “Sir”.
- v. Not answer with anger but should give his/her suggestion politely if disagrees.
- vi. Be impartial.

vi. If he/she does not know the answer, must admit the lack of knowledge instead of false manipulations.

vii. After answering the question he/she should leave the court with the permission of court of justice.

Types of witness

There are two main types.

❖ Common Witness

❖ Expert Witness

1. Common Witness

Common Witness is one who gives opinion about the issue, which is perceived through any of his senses (eye, ear, taste, smell, touch). ii. He / She cannot draw any inference from observation and volunteer a statement.

2. Expert Witness

Expert witness is well-qualified authority who gives scientific opinion in the case of trial. ii. Expert witness draw conclusion from the fact observed by him/her. iii. Medical practitioner can act both as expert witness and common witness.

3. Hostile Witness

A hostile witness is one who purposely makes statement contrary to the facts he has already said in the lower court or in the same court on previous occasions.

The ordinary as well as the expert witness may become hostile. Such a witness is being examined by putting the leading questions in the chief examination to elicit the facts.

CHAPTER SIX



CRIMINAL PROCEDURE AND FORENSICS

CRIMINAL SUMMONS

A criminal summon is a simple court document that contains a number of facts -justifying an inquiry into a complaint against an accused person and requiring him to attend the inquiry. In other words, it is a document, issued by the court to be served on the person addressed in it, requiring that person to appear before court on the date specified in the document to answer charges brought against him/her.

FORMS AND CONTENTS OF A CRIMINAL SUMMON

According to section 44 (1) of the MCA, every summons must be in writing, prepared in duplicate, signed and sealed by the magistrate or such other officer as the chief justice may from time to time direct.

Section 44(2) every summons must be directed to the person summoned and shall require him or her to appear at a place, date, time indicated therein before the court having jurisdiction to inquire into and deal with the complaint or charge.

Section 44(3) a summons must also state shortly the offence with which the

person against whom it is issued is charged. This is basically for purposes of letting the accused know and prepare for the charge he is being compelled to answer.

SERVICE OF SUMMONS

Service of summons to accused personally

According to section 45 (1) MCA, every summons must be served by a police officer or an officer of the court issuing it or any public servant but in practice, a summons is served by a police officer or an officer of the court called a process server. A summons must be served onto the person to whom it is addressed personally but the section states, if practicable.

The summons is served on the accused by giving him a duplicate of the summons and in practice he must sign the original copy of the summons. S.45 (2) MCA provides that every person on whom a summons is so served shall, if so required by the serving officer, sign a receipt of it on the back of the original summons.

Service of summons when person/accused cannot be found

Sometimes it may not be possible after the exercise of due diligence to serve the accused personally, in which case service of the summons may be effected by leaving the duplicate of the summons for the accused with an adult member of the family or the accused's servant who normally resides with him, or by leaving it with his employer.

The person with whom the summons is left, if so required by the process server, must sign receipt of it on the back of the original summons.

A Look at section 46 MCA

Where the person summoned cannot, by the exercise of due diligence be found, the summons may be served by leaving the duplicate for the person with some adult member of his or her family or with his or her servant residing with him or her or with his or her employer; and the person with whom the summons is so left shall, if so required by the serving officer, sign a receipt of it on the back of the original.

Procedure when service cannot be effected

Section 47 MCA, if service in the manner provided by sections 45 & 46 of the MCA cannot by the exercise of due diligence, be effected, the serving officer shall affix the duplicate of the summons to some conspicuous part of the house or home stead in which the person summoned ordinarily resides, and thereupon the summons shall be deemed to have been duly served.

Service of a criminal summons on a company

It is common knowledge that in law a body corporate is a legal person criminally liable except in certain cases, to the same extent as a natural person. For this reason, provision has been made for compelling a body corporate to answer charges against it in a court of law.

According to section 49 of the MCA, service of summons on an incorporated company or other body corporate may be effected by serving it on the secretary, local manager or other principal officer of the corporation or by registered letter addressed to the chief officer of the corporation or by registered letter addressed to the chief officer of the corporation at the registered office of the company or body corporate in Uganda.

Service of criminal summons on a body corporate can be done by sending the summons by registered mail addressed to the chief officer of the company, secretary, local manager or other principal officer of the company. These officers of a company are deemed competent to plead on behalf of the company.

Proof that service was effected

Where may summons be served?

Under section 50, a summons may be served at any place in Uganda. So sometimes it may be necessary to prove that a summons was served especially

- a) Where the summons was served outside the local limits of jurisdiction of the presiding court
- b) If the accused for whom the summons was intended does not appear at the place, date, and time indicated, the court might either on its own or upon application by the prosecution decide to issue a warrant for his apprehension.

But before the court does so, it will be necessary to show by evidence that the accused was served and had deliberately refused to obey the summons.

Under section 51 of the MCA, ordinarily proof of service of summons shall be given by calling the process server to give evidence on oath that service was effected. But where the officer is not present or the summons was served outside the local limits of the jurisdiction of the issuing magistrate, proof may be effected by the person with whom the summons was left, swearing an affidavit before a magistrate and presenting the original summons duly endorsed in the manner described above.

Even if the original summons is not endorsed, the affidavit shall be admissible in evidence if the court is satisfied from the statements made in it that service of the summons has been effected properly. S. 51(2) MCA.

From what has been discussed above, under what circumstances will an original summons not be endorsed?

Criminal litigation begins with the filing of charges, usually by some prosecuting authority appointed by the government to enforce the criminal law. Depending on the subject matter and legal source of the charge, the authority will be the police or some other regulatory body. The charges are filed, usually after the investigation (or at least the vast majority of the investigation) has been completed by the relevant authority. Often, prior to the filing of the charges, the suspect is interviewed by police, and the nature of the allegations is put to him or her. Commonly, the interview is electronically recorded, either in audio or sometimes in video. Upon the filing of the charges, the Suspect becomes the Defendant, and the adversarial process begins with the prosecution formally leveling the allegations against the Defendant. The case then typically proceeds through a number of preliminary or “interlocutory” steps whereby the

prosecution concludes its investigation against the Defendant and provides copies of the witness statements and access to the physical exhibits (or copies if such can be provided) of the physical exhibits that it intends to rely on in proving its case against the Defendant.

COMMITTAL HEARING

After the Defendant has had the opportunity of considering the prosecution's evidence, he or she is afforded the opportunity of testing the evidence of witnesses, by cross-examination. For serious offenses (referred to as indictable offenses), the Defendant can do this first in the absence of the jury at a preliminary hearing, often referred to as a committal. While some Australian jurisdictions have done away with committal hearings altogether, other states have permitted them, but only where the Defendant shows why the cross-examination of specific witnesses is relevant and justified. The committal hearing is the first opportunity for the Defendant to hear and see the witnesses who are to give evidence against him or her. It also gives the Defendant the opportunity to test, through cross-examination. Cross-examination is the tool that lawyers use to test a witness's evidence. It may be designed to illicit the truth or reveal a lie or show that, while the witness may be truthful, he or she is otherwise unreliable. At committal, the cross-examination is either aimed at having the charges dismissed or laying a foundation so that cross-examination of the witness at the later trial may be more successful, or even devastate the prosecution case. There is no jury at committal.¹⁴ The hearing is presided over by an appointed official, usually a magistrate (a judicial officer), exercising

administrative rather than judicial power.¹⁵ At the conclusion of the committal hearing, the magistrate is required to consider whether the prosecution's evidence is of sufficient weight to put the defendant on trial for any indictable (serious) offense, whether charged with that offense or not.

Generally, prosecutions are brought by the police or the Director of Public Prosecutions

representing the Crown (i.e., State or Commonwealth). However, this does not mean that a private individual cannot bring a private criminal prosecution, though this is rarely done. In the state of Victoria, the Director of Public Prosecutions has the right to "take over" the prosecution of any individual under state legislation, whether or not that prosecution was commenced by the DPP or on his or her behalf: s 22 (1)(ii) of the Public Prosecutions Act (Vic) 1994. ¹³See, for example, Victoria where the procedure is regulated by the Magistrates' Court Act 1989 (Vic). Also note that due to policy reasons, some state legislatures have placed a ban on the cross-examination of child sex complainants at committal, limiting the defendant's right to cross-examine his or her accuser to the ultimate trial. Even then the cross-examination may only be permitted to be done via video-link and done at some prearranged time when the jury are not present, with the video of the cross-examination played to them sometime later.

THE TRIAL

Should a Defendant be committed for trial, then the matter is transferred to a court of higher jurisdiction; the level of the court will be dependent on the nature of the charges on which he or she was committed. In all Australian

states, homicide offenses are ultimately tried in the state Supreme Courts, whereas most other indictable offenses are heard and determined in the District Court. Unlike a committal, in all jurisdictions, a Defendant (now referred to as an Accused following committal) is entitled to cross-examine witnesses called by the prosecution. Unlike the committal procedure in some states which require the court's permission for cross-examination, fundamental to the adversarial principles of procedural fairness, the Accused can (usually via his or her counsel) fully engage in the adversarial process and "attack" either the credit or credibility of the witnesses. As discussed, at trial, this is usually done before a judge and jury: the judge being the judge of the law and the jury being the judges of the facts. The trial is also the opportunity for the Accused to call witnesses (although this can be done at committal, it is extremely rare for a Defendant to call witnesses or give evidence at committal). However, just as the Accused has the right to cross-examine the prosecution witnesses, so too the prosecution may cross-examine witnesses called by the Accused upon his or her trial (including the Accused should he or she elect to give evidence). A trial begins with opening remarks from the prosecutor where the evidence to be called is outlined. Often the defense counsel will then advise the jury of the areas of dispute, thereby focusing the jury's attention on the evidence that is to be contentious.¹⁰ Following the opening remarks, the prosecutor calls

¹⁰ Although preliminary hearing by grand jury is still available in some states, see, for example, s 354 of the Crimes Act 1958 (Vic). ¹⁵This means that it is not appealable by courts within the usual court hierarchy but may, however, be reviewable by a court of inherent (or statutory) jurisdiction as if decision were one of a government official exercising power on behalf of the executive. ¹⁶ See for example, Queensland—Justices Act 1886, s 108; Tasmania—Justices Act 1959, ss 61 & 62.

witnesses, who in turn may be cross-examined by the defense counsel (and re-examined by the prosecutor to clarify his or her evidence if necessary). After the prosecution has called all of its witnesses, the prosecution case is formally closed. It is at this juncture that the Accused gives evidence, if he or she so chooses. Other defense witnesses then follow (if they are to be called), and the process of cross-examination and re-examination occurs, but this time with the prosecutor cross-examining and the defense counsel re-examining. When all the evidence is heard, the parties then give their closing remarks, the prosecutor usually going before defense counsel. During closing remarks, the parties may engage in argument before the jury and make submissions to the jury as to which evidence they should accept, which evidence they should reject, and why. Both prosecutor and defense counsel may argue that certain evidence should apply to the issues in dispute in a way which advances their case. To this end, the closing argument is the opportunity for the lawyers to implore the jury to accept their interpretation of all the evidence and their rationalization of its meaning to the case. Before the jury consider their verdict, the judge provides them with directions as to the law which they need to apply in reaching their decision. The judge will identify those matters of which they need to be satisfied before they may convict the Accused and the standard to which they need to be satisfied: beyond reasonable doubt. The judge will tell them how they may use certain types of evidence and, equally, how they may not use other types of evidence. What the judge tells the jury about the law is binding upon them. Unlike the prosecutor and defense counsel's closing

arguments, the jury are not free to accept or reject what the judge tells them about the law. The jury cannot place less or more weight on the judge's direction of law, as they may do with parts of the evidence. The judge is the judge of the law, and the jury are bound by what he or she says about it. The judge may, if he or she thinks it necessary, make some comment on the evidence or on some argument put to the jury by the lawyers. Unlike the judge's direction on the law, in these matters the jury are free to accept or reject the judge's comments on the evidence or argument just as they are free to accept or reject the lawyers' arguments made.

THE VERDICT

Armed with law they require to arrive at a decision, the evidence presented and arguments of the prosecutor and defense counsel ringing in their ears, the jury then retire to deliberate and consider their verdict. The verdict must be unanimous: either all 12 are satisfied that the prosecution has proved the guilt of the Accused beyond reasonable doubt or they are not. It is significant to note at this stage that a verdict of "not guilty" (see "not guilty" verdict) is technically more akin to the phrase "not proven beyond reasonable doubt" rather than that of "innocent." Although provision is made in some jurisdictions for a "majority verdict" of 11 of the 12 jurors to be returned after a lengthy dead-locked deliberation with respect to certain offenses

Should a jury be unable to reach a unanimous verdict, then by the stalemate the jury are said to be "hung" (see hung jury in key terms list). The jury is then discharged and the trial is run again before another jury. Should the jury

unanimously find that the prosecution has failed to discharge its burden of proof, then the verdict will properly be one of “not guilty.” The Accused is then set free. Generally, the Accuser’s acquittal cannot be appealed by the prosecution, nor can he or she be tried again for the same charges nor for charges arising from the same set of circumstances.¹⁸ Sentencing Phase Upon a finding of guilt (which may be achieved at any stage of the process by the Defendant/Accused pleading guilty to the offense or offenses), the jury is discharged and the matter falls to the consideration of a judge alone. The Accused again takes on another label, that of the Prisoner. That is so even if the Accused is not ultimately sentenced to imprisonment. At this stage, the proceedings enter into the sentencing (also known as plea) phase whereby evidence is led and argument is made on the Prisoner’s behalf with the aim of mitigating the sentence. Often the prosecution will also lead evidence, beyond that which was led at the trial to establish the effect of the Prisoner’s crime and otherwise to counter the evidence and arguments led on behalf of the Prisoner. Finally, after considering the facts and circumstances of the Prisoner’s offending and matters personal to the offender, the judge will pass sentence. Sentences in Uganda can range from a finding of guilt without further order to life imprisonment.

BAIL APPLICATION

When a Suspect is first charged, he or she may be remanded into custody pending the outcome of the matter. Whether or not this occurs will be dependent on the nature of the charges filed, the circumstances of the alleged

offending, and matters personal to the specific Defendant, such as the risks posed of:

- Fleeing the jurisdiction while awaiting trial;
- Failing to appear at court when required; or
- Offending further.

An application for bail can be brought at any time prior to the conclusion of the trial and, in some circumstances, between the jury's guilty verdict and the conclusion of the sentencing phase. The application is usually brought in the court through which the case is, at that time, proceeding. However, a court of inherent jurisdiction in any state (i.e., Supreme Court) may hear and determine a bail application at any time (even pending appeal). A bail application usually involves the court receiving evidence, either *viva voce*, or in the form of an affidavit. Upon that evidence (although the laws of evidence do not strictly apply to an application for bail), the court will determine whether the Defendant/Accused/Prisoner is to be granted bail or whether he or she represents an unacceptable risk.

The rule against double jeopardy applies in practice to prohibit both prosecution appeals against an accuser's acquittal and the retrying of an accused. However, this rule is not as concrete as it once was, and some common law jurisdictions, both within Uganda and outside, have done away with the rule by enacting statutory exceptions to the rule; for example, in New South Wales, see Part 8 of the Crimes (Appeal and Review) Act 2001 (NSW). Sometimes the first application for bail is made before a bail justice out of

hours. This is not an example of a court process but rather the exercise of power conferred expressly by statute.

Originally bail meant security given to court by another person that the accused will attend his trial on the day appointed. But these days, it includes a recognizance entered into by the accused himself conditioning him to appear and failure of which may result of the forfeiture of the recognizance.

According to the case of **Lawrence Luzinda V Uganda [1986] HCB 33**, the definition of bail was given by justice Okello and he stated that bail is an agreement between the court, the accused and sureties on the other hand that the accused will attend his trial when summoned to do so.

An amount of money or property must be deposited by an accused person with the court in order to be released from custody. This in law is called a recognizance.

According to the late Ayume in his book, criminal procedure in Uganda at pg 54, he said that there are two basic principles underlying bail. The first principle is that the accused is innocent until proved guilty or until he pleads guilty and therefore it would be unfair in certain circumstances to keep him in prison without trial. This is also enshrined in our constitution of 1995 in Article 28(3) (a).

The second principle underlying bail is that the only person capable of building up his defence at the trial may be the accused himself. If he is released on bail, it must be on the understanding that he will turn up for his trial. There fore there are good reasons why the accused would want to be released on bail. If

employed, he would likely lose his job or have his business damaged while in prison.

Even section 17(1) of the CPC states that except in cases of a serious nature, like treason, rape and murder, aggravated robbery, etc. the officer in charge of a police station has powers to release a person who has been arrested without a warrant on bond if that person cannot be produced before a magistrate within twenty-four hours. The officer releases the arrested person against that person executing a bond, with or without sureties for a reasonable sum determined, requiring him to appear before a magistrate's court at a time and place named therein.

Constitutional provisions on Bail

The Constitution of the Republic of Uganda, 1995 contains provisions on the protection and promotion of fundamental human rights and freedoms.

Article 20 (1) provides that fundamental rights and freedoms are inherent and not granted by the state. **Article 20 (2)** provides that all those rights and freedoms must be respected, upheld and

promoted by all organs and agencies of Government and by all persons.

Article 28 (3) thereof provides that every person who is charged with a criminal offence shall be presumed to be innocent until proven guilty or until that person has pleaded guilty is the basis on which the accused person enters into an agreement with the court on his recognisance that he appear and attend his trial whenever summoned to do so. Bail gives the accused person adequate time to prepare his or her defence. (**Article 28 (3) (c)**).

Hence **Article 23 (6)** provides that where a person is arrested in respect of a criminal offence the **person is entitled to apply to the court to be released on bail, and the Court may grant that person bail on such conditions as the Court considers reasonable.**

Applying the interpretation of article 23(6)(a) as amended by the judges in the case of Uganda V/s Col (Rtd) Dr. Kiiza Besigye, Constitutional Reference No.20 of 2005

Under article 23 (6)(a) of the constitution, where the accused person has been in custody for 60 days before trial for a non capital offence here, the court has no discretion in the matter. It has to grant bail upon such terms as the court deems reasonable.

Article 23(6)(c) of the constitution where the accused person is indicted with capital offences triable by the High Court only. In this case once the accused person has spent 180 days on remand, then the court has to release him/her on automatic bail upon reasonable conditions.

According to Justice Akiiki Kiiza in Florence Byabazaire's application for bail, it appears the accused can only benefit from this article, if he is not yet committed to the High Court for trial.

Their Lordships had the following to say in Kiiza Besigye's reference

“as regards article 23(6)(c), where the accused has been in custody for 180 days on an offence triable by the High Court only and **HAS NOT BEEN COMMITTED** to the High Court for trial, that person shall be released on bail on reasonable conditions’.

In the situation where the accused is charged with an offence only triable by the High Court, but has not spent the statutory period of 180 days in custody before committal, in this case, the court may refuse to grant bail where the accused fails to show to the satisfaction of the court exceptional circumstances under section 15(3) of the Trial on Indictments (Amendment) Act 9/98 (cap 23). These circumstances are regulatory.

The Lordships went on to state as follows;

“it is noteworthy that this is a 1998 Act, which came into force well after the constitution of 1995. its sole purpose was to operationalise article 23 (6) (c) for the accused desirous for applying for release on bail before the expiry of the constitutional time limit of 180 days.

Justice Akiki Kiiza said in Byabazaire’s application that before the High Court can release an accused on bail, one of the conditions or exceptional circumstances outlined in s. 15(3) of TIA must be satisfied and dismissed the applicant’s application on the ground that none of the exceptional circumstances had been satisfied.

Is Bail a constitutional right and therefore automatic?

Generally, the grant of bail is discretionary. Court must always exercise its discretion judiciously and always give the accused the benefit of doubt. Magistrates and Judges have interpreted the provisions regarding the conditions

and considerations in different ways with some stating that they must be fulfilled before a person can be granted bail, while others holding that it is a constitutional right.

The right to bail is a constitutional protection of the right to personal liberty clearly based on the presumption of innocence which must thus not be denied lightly. An accused person charged with a criminal offence must be informed of his right to bail. It is not a constitutional right to automatic bail but a right to apply for bail.

The later view is the one that has been propagated by judges in most of the recent judgments as seen hereunder;

Powers of Magistrate's courts to grant Bail

The Magistrates Courts Act Cap 16, section **75 (1)** states that a Magistrate Court before which a person appears or is brought charged with any offence other than the offences specified in **ss. (2)** may, at any stage in the proceedings, release the person on bail, on taking from him or her a recognisance consisting of a bond with or without sureties, for such an amount as is reasonable in the circumstances of the case to appear before the Court, on such a date and at such time as is named in the bond.

Section 75(2) of the MCA provides that the offences excluded from the grant of bail under subsection (1) are as follows;

- (a) an offence triable only by the High Court
- (b) an offence under the penal code relating to acts of terrorism

- (c) an offence under the penal code relating to acts of cattle rustling
- (d) an offence under the firearms act punishable by a sentence of imprisonment of not less than 10 years;
- (e) abuse of office c/s 87 of the Penal code
- (f) rape c/s 123 of the Penal code and defilement c/s 129 & 130 of the penal code act;
- (g) embezzlement;
- (h) causing financial loss
- (i) corruption
- (j) bribery of a member of a public body
- (k) any other offence in respect of which a magistrate's court has no jurisdiction to grant bail.

A chief magistrate has powers under s.75(3) to direct that any person to whom bail has been refused by the lower court within the area of his or her jurisdiction, be released on bail but the offence for which the accused faces must not be one that falls under subsection 2.

CONSIDERATIONS FOR BAIL IN THE MAGISTRATE'S COURT

Conditions for the grant of Bail:

In as much as the accused person has a constitutional right to apply for bail as enshrined in article 23(6)(a) of the 1995 constitution, the grant of bail is subject to some conditions being fulfilled by the person seeking bail. **As per Justice Akiiki Kiiza in the application for bail by Florence Byabazaire Vs. Uganda**

284 of 2006, Bail is not an automatic right. **Article 23(6)(a)** confers discretion upon the court whether to grant bail or not.

The conditions / considerations for granting bail are set out in both the **Trial on Indictments Act Cap 23 for bail applications made in the High Court** and the **Magistrate Courts Act Cap 16 for applications made to the Magistrate's court.**

Section 77 MCA sets down some considerations that the Magistrate Court must have regard for in deciding whether bail should be granted or refused-

- a) The nature of the accusation; see *Uganda Vs. Mugerwa & Anor* [1975] HCB 218.
- b) The gravity of the offence charged and the severity of the punishment which conviction might entail; (it is more likely that bail will be refused where the offence is so grave as to warrant a severe penalty).
- c) The antecedents of the applicant so far as they are known;(it would be a mockery of the judicial process and a miscarriage of justice if bail were to be granted to a person who has a staggering record of previous convictions to his name, which is an indication of his likelihood of committing further crimes if released on bail).
- d) Whether the applicant has a fixed abode within the area of the court's jurisdiction; (**Sudhir Ruparelia Vs. Uganda** [1992-1993] HCB 52, (the fact that the accused has a kibanja, and that he has sixteen wives and or twenty-four children, may be an indication that he is unlikely to abscond. But this by itself cannot be a ground for releasing a person on bail- **Livingstone Mukasa & 5 others vs Uganda** [1976] HCB 117.

- e) Whether the applicant is likely to interfere with any of the witnesses for the prosecution or any of the evidence to be tendered in support of the charge. (In the case of *Uganda Vs. Wilberforce Nadiope and 5 others*, bail was refused on the ground that because of the accused person's prominence and apparent influence in life, there was every likelihood of his using his influence to interfere with witnesses.

Powers of the high court to grant Bail

The Trial on Indictment Act Cap 23 **section 14** provides that the High Court may at any stage of the proceedings release an accused person on bail, that is to say, on taking from him or her a recognizance consisting of a bond, with or without sureties, for such an amount as is reasonable in the circumstances of the case, to appear before the court on such a date and at such a time as is named in the bond.

Bail is a kind of insurance to guarantee that the accused will appear in Court for his or her trial. Where the accused fails to appear before the Court when ordered to do so, his or her bail money is forfeited.

The High court has powers after releasing an accused person on bail to increase the amount of the bail. This the court will do by issuing a warrant of arrest against the person released on bail directing that he be brought before the court to execute a new bond for an increased amount; and the High court will have powers to commit the person to prison if he or she fails to execute the new bond for an increased amount. (**Section 14 (2) of the TIA**)

Bail money may be paid up by the accused or someone on his or her behalf. A person released on bail may or may not be asked to put up people as his or her **sureties** to stand up for him or her before the Court.

A **Surety** gives security to the Court that the accused will attend his trial on the hearing date fixed by the court.

Recognisance is a security entered in to before a Court with a condition to perform some act required by Law; on failure to perform that act, the sum is forfeited.

Bail allows an accused person to be temporarily released from custody (usually on condition that the recognizance usually in the form of a sum of money guarantees their attendance at the trial).

Bail money should not be excessively high so that the accused is unable to pay it.

In **Charles Onyango Obbo & Andrew Mwenda v Uganda (1997)5 KALR 25** The High Court was empowered to interfere with the discretion of the lower court while granting bail under s. 75 (4)(a) MCA where it is shown that the discretion was not exercised judiciously. The imposition of a condition that each accused should pay 2,000,000/-, was a failure by the lower court to judiciously exercise its discretion according to **Bossa J.**

While court should take into account the accused's ability to pay, while exercising its discretion to grant bail on certain conditions, the court should not impose such tough conditions that bail looks like a punishment to the accused.

Considerations for Bail in the High Court

S. 15 (1) TIA provides that Court **may refuse to grant bail** where a person accused of an offence specified in ss (2) if he or she does not prove to the satisfaction of the Court

- a) That exceptional circumstances exist justifying his or her release on bail; and
- b) That he or she will not abscond when released on bail.

In **S. 15 (3)** exceptional circumstances mean

- (a) Grave illness certified by a medical officer of the prison or other institution or place where the accused is detained as being incapable of adequate medical treatment while the accused is in custody. (**Capt. Wilberforce Serunkuma Vs. Uganda [1995] I KALR 32**)

The applicant was charged with aggravated robbery and had been on remand for eight months. He brought an application for bail basing on he exceptional circumstances of grave illness. In his affidavit supporting the application the applicant deponed that he was an AIDS Victim and needed constant care which he could not get while in prision. He brought documents to prove that he had been attending AIDS clinics like TASO. It was held that where satisfactory evidence of AIDS is adduced, a court may consider the circumstances of the case and in the absence of a certificate from the medical board hold that AIDS is grave illness, and to justify grant of bail, the applicant has to prove to the satisfaction of the court that he was

incapable of getting adequate treatment whilst in custody. In this case, all the applicant had were documents from TASO indicating that he was an AIDS victim and no report was made by any doctor who treated him at Luzira or mbuya military hospital to show that he could get adequate treatment whilst in custody.

(b) A certificate of no objection signed by the Director of Public Prosecutions, or

(c) The infancy or advanced age of the accused. (**Mutyaba Semu V Uganda** the accused was a 60-year-old and suffered from diabetes and he brought an application for bail on the ground that he was of advanced age. It was held that 60 years per se was not advanced age but this coupled with the fact that the accused suffered from diabetes, a disease that required a good diet which could not be provided by prison authorities he would be granted bail.

Section 15 (4) provides that in considering whether or not the accused is likely to abscond, the court may take into account the following factors-

- a. Whether the accused has a fixed place of abode within the jurisdiction of the Court or is ordinarily resident outside Uganda. (**Christopher John Boehlke v Uganda Misc. Application 332 of 2006**)- no fixed place of abode and a non resident. Look at the conditions considered in this case.

Dennis Obua Otima v Uganda H C Crim. App No 18 of 2005

The applicant was charged with embezzlement and causing financial loss applied for bail on the assertion that he was of advanced age and that he is

such a person entitled to be released on bail. **Justice Remmy Kasule** looked at the considerations in light of the other factors which court uses to deny bail. Firstly, is whether the accused is likely to interfere with the prosecution evidence. Where it is found to be the case, the court would exercise its discretion by refusing bail. Secondly is to prevent a perception of the justice system as being a mockery of justice. This discretion to refuse bail is vested by the constitution. **Article 23 (6) (a)**

- b. Whether the accused has sound securities within the jurisdiction to undertake that the accused shall comply with the conditions of his or her bail,
- c. Whether the accused has on previous occasion when released on bail failed to comply with the conditions of his or her bail; and
- d. Whether there are other charges pending against the accused.

VOIRE DIRE

Another procedure which may occur during the running of the trial is that of the voir dire (pronounced vwaahdeer). A voir dire is a trial within a trial and is reserved to be considered and determined by the trial judge only. The purpose of a voir dire is to consider a legal point which must be decided prior to the considerations of the jury. Often the admissibility of expert evidence is determined by a judge on a voir dire. The conduct of a voir dire will be dependent on the subject matter being considered in the voir dire and the way in which the trial judge seeks for it to be conducted. It may involve the reception of evidence and cross-examination of witnesses. Alternatively, it may involve only legal argument as to an interpretation of law.

CIVIL PROCEDURE

Civil litigation is commenced by a party (the plaintiff or applicant) filing initiating documentation in the court in which he or she wishes to sue. Depending on the court and subject matter of the suit, this documentation may be an originating motion, a summons, or a writ. The natures of civil proceedings vary broadly depending on the claim being brought. However, in common law jurisdictions, the parties are expected to clearly identify the facts, acts, matters and things which they say, if proved, will make out their claim (or defense to the claim). Moreover, the parties are expected to provide the other side with documents in their respective possession that relate to the issues in the claim, whether they support their case or not. This is referred to as discovery and is fundamental to notions of procedural fairness. Also fundamental to the principles of procedural fairness is the right to representation (and all that brings). For this reason, the law recognizes that a party is not required to “discover” documents (or any communication) that are protected by “legal professional privilege.” This is a wide and complex area of law; however, for the purposes of this work, the relevant test can be seen as thus: Is the dominant purpose of the documents generation either (Heydon, 2004): 1. To enable that party to obtain or in the receiving by that party of, legal advice; or 2. With reference to litigation that is occurring, or at the time of the documents’ creation, was anticipated.

The court will be determined by reference to, among other things, the nature of the remedy (including the amount of any monies claimed), the subject matter of the litigation, and the law under which the suit is brought.

The law of legal professional privilege also protects from the duty of Discovery Communications (and documents) to third parties, such as experts, engaged by the party as long as they fall into category (2) above. This has a direct application to the practice of the expert witness and will be discussed further later. A civil suit, like a criminal case, usually involves two distinct considerations. However, unlike a criminal case, where the liability and penalty phases are run consecutively, in a civil case the issues are often run concurrently. The first is the question of liability; that is, is the defendant legally responsible to the plaintiff for the claim brought? The second is the question of quantum: how much does that legal responsibility amount to in terms of money? A civil suit may be fought on either or both of these bases, and each consideration is governed by its own laws and precedents. Common law jurisdictions provide that some civil cases may be determined, at least on the question of liability, by juries. Depending on the subject matter, juries may be asked to determine the question of quantum. In the United States, juries are used much more widely than in Australia when it comes to civil cases both on issues of liability and quantum. The nature of the claim, and often the election of the parties, will determine whether a jury will determine a civil case in Australia. If a claim is to be considered without a jury, then the judge is the judge of both law and fact.

PLEAS

A plea is an answer to a charge. It may be an admission or a denial to a charge. It may be a defence or an objection to the charge being brought against the

accused. That being the case, there are various types of pleas that an accused can raise at the time of pleading or at his trial.

The possible pleas are;

1. A PLEA OF GUILTY
2. A PLEA OF GUILTY TO A LESSER CHARGE
3. AMBIGUOUS PLEAS
4. REFUSAL TO PLEAD
5. UNFITNESS TO PLEAD OR TO BE TRIED
6. PLEAS OF AUTRE FOIS AQUIT OR AUTRE FOIS CONVICT OR PARDON
7. A PLEA TO THE JURISDICTION
8. A PLEA OF NOT GUILTY

Plea of guilty

If the accused pleads guilty to all charges, the accused is either sentenced immediately or remanded for reports. It is however important that the accused personally pleads guilty. It is insufficient for the advocate to say that the accused wishes to plead guilty. Where there is more than one accused, and one pleads guilty and the other pleads not guilty, the usual practice is to postpone the sentencing of the accused who pleads guilty until the end of the trial of the accused who pleads not guilty.

Plea of guilty to a lesser offence

The accused may plead not guilty to the offence charged and plead guilty to another offence of which the accused is not charged. i.e an accused charged

with burglary may plead to that offence and plead guilty to theft. If the prosecution accepts a plea to the lesser offence and the judge approves it, the accused will be acquitted of the offence charged and sentenced for the lesser offence. If the prosecution refuses to accept a plea of guilty to the lesser offence, the trial must proceed on the basis of the offence as charged and if the jury acquits the accused of that offence, the accused cannot be sentenced for the lesser offence even though they intended to plead guilty to it.

Ambiguous plea

Sometimes an accused may plead guilty but at the same time make statements which qualify the plea. For example, where a person charged with handling stolen goods by receiving them pleads guilty to this offence but states that they did not know that the goods were stolen, the plea is ambiguous.

If the accused continues to plead in this manner a plea of not guilty should be entered. Where the plea is ambiguous and the court wrongly considers it to be a guilty plea, the appellate court may quash the conviction or order that a not guilty plea be entered and the appellant tried on the indictment.

Refusal to plead

Where the accused refuses to plead or remains silent when asked how they wish to plead, a plea of not guilty should be entered. Section 124 (4) of the MCA

Pleas of autrefois acquit or autre fois convict

These two pleas- meaning previously acquitted and previously convicted respectively are based on the fundamental principle of English law that a

person is not to be prosecuted twice for the same offence. Where one or the other plea is successfully raised, it bars all further proceedings for the same offence.

Autre fois acquit is a fundamental principle of law that a man may not be put twice to jeopardy for the same offence. This term commonly means that if a man has been tried and found not to be guilty of an offence by a court of competent jurisdiction, the acquittal will be a bar to a subsequent charge for the same offence. S.89 MCA

Autre fois convict on the other hand is to the effect that the accused cannot be convicted of an offence which is the same as that of which he was previously charged and convicted. This rule was stated in the case of *R v Thomas*. In this case the accused was convicted of wounding his wife with intent to murder her and was sentenced to seven years imprisonment. Within a year after the wounding, the wife died. The court of appeal held that although the accused had been convicted and sentenced for the wounding, he could properly be tried for the murder and could not plead *autre fois convict*. Here the death supervened as a result of the attack and the fact that the attacker had already been convicted of a lesser offence relating to the attack was no bar to the subsequent charge and conviction of murder.

In *R v Daudji*, it was stated that the test is not whether the facts relied upon are similar but whether the accused has been tried and convicted of an offence which is the same as that with which he is charged.

Pardon

Under Article 121 of the 1995 constitution, the president of Uganda can exercise his prerogative of mercy by granting pardon to a person convicted of a criminal offence.

When a plea of autre fois acquit, autre fois convict or pardon are raised, this will become a triable issue of the court. The court will have to determine and decide on the evidence whether such plea is true or false.

Section 93(a) MCA provides that a previous conviction or acquittal can be proved by an extract certified under the hand of the officer having custody of the records of the court.

A plea to the jurisdiction

The accused can plead that the court has no jurisdiction to try the charges preferred. Such a plea must be in writing. The accused can plead not guilty in addition to pleading lack of jurisdiction or demurrer. This is most common in civil matters.

A plea of not guilty

An accused may plead not guilty to some or all the counts on the indictment where he is charged with more than one offence.

RECORDING OF PLEAS

Having checked that the charge is in order, the magistrate will read and explain out the charge to the accused and ask the accused to state whether he understands the substance of the charges against him. Section 124 of the MCA

lays down the procedure of recording pleas in a magistrate's court. This procedure was also set out in the case of Adan v R.

According to this case, when an accused person is charged with an offence, the charge and the particulars of the offence thereof should be read out to the accused so far as possible in his own language but if that is not possible then in the language he can speak and understand.

Thereafter the court should explain to the accused the essential ingredients of the charge and he should be asked if he admits them. If the accused admits the truth of the charge, his answer should be recorded as nearly as possible in his own words and then a plea of guilty formerly entered.

If the accused doesn't agree with the facts as stated by the prosecutor or introduces additional facts which if true might raise a question as to his guilt, a plea of not guilty should be recorded and the trial proceeds.

If the accused doesn't dispute any of the alleged facts, a conviction should be recorded and further facts relating to the question of sentencing should be given before the sentence is passed.

CHANGE OF PLEAS

An accused person is free to change his plea at any time during the proceedings provided he does so before sentence is passed upon him. An accused may with the leave of the court change a plea of not guilty and plead guilty to all or some of the counts. The normal procedure in such cases is for the relevant charges to be put to the accused again and for the accused to plead guilty to them.

It should be noted that a change of plea from a plea of guilty to a plea of not guilty should be allowed only in very clear cases e.g due to a language problem the accused may have misunderstood the charge. It should also be noted that not every accused who wants to change what is clearly a plea of guilty should be allowed to do so at his won convenience.

In *R v Patel and another*, it was held that once sentence had been passed upon a person who has un equivocally pleaded guilty, he cannot afterwards be allowed to retract the plea.

FUNCTUS OFFICIO RULE

The term *functus officio* is a latin phrase meaning that having discharged a duty/authority to act further is exhausted. In relation to court proceedings it means that once court has finally determined a case, it has no powers to adjudicate upon it again. When a court has determined a case by passing sentence, following a plea of guilty it is *functus officio* so that even if the accused wishes to change his plea, the court will have no power to permit him to do so.

In *Lapi and others v Uganda*, a magistrate convicted the three appellants and sentenced each one of them to 7 years imprisonment. Immediately thereafter, two of them insulted the magistrate who thereupon enhanced their sentences, each to 7 years and a half imprisonment. On appeal, it was held that as soon as the magistrate convicted and sentenced the appellants, he had become *functus officio* and therefore had no jurisdiction to alter either the sentence or the conviction.

In Uganda v Micheal Ogwang

Okello J stated that it is trite law that until it passed sentence, a trial court was not functus officio in a case. It could properly permit a plea of guilty in substitution of a plea of not guilty.

In r v thomus here the man who had wounded his wife raised the deffence of previous conviction but it never succeeded

In the case of daudji it was observed that it is not that the facts that the accused is convicted with are the same but the offence is the one that is the same.

In the case of Adan, it is basically on the procedure in the magistrate courts. In patel's case aplea of guilty can not be retracted after passing sentence.

THE PROCEDURE OF HEARING AND DETERMINING CASES IN THE HIGH COURT

Section 1 of the TIA provides that the High court shall have jurisdiction to try any offence under any written law and may pass any sentence authorised by law, provided that no criminal case shall be brought under the cognisance of the high court for trial unless the accused person has been committed for trial to the high court in accordance with the provisions of the MCA.

Section 168 MCA provides for the preliminary proceedings in cases to be tried by the high court. (These are cases which carry a maximum penalty of death)

Under Section 168 (1) MCA, when a person is charged in a magistrate's court with an offence to be tried by the high court, the DPP will be required to file in the magistrate's court an indictment and a summary of the case signed by him

or her or by an officer authorised by him or her in that behalf acting in accordance with the instructions.

Section 168(2) MCA, the summary of the case shall contain such particulars as are necessary to give the accused person reasonable information as to the nature of the offence with which he or she is charged Section 168(3) MCA, when a person charged with an offence to be tried by the high court appears before a magistrate, and the DPP has complied with subsection (1), the magistrate shall-

- a) give the accused a copy of the indictment together with the summary of the case
- b) read out the indictment and the summary of the case and explain to the accused person the nature of the accusation against him or her in a language he or she understands and inform him or her that he or she is not required to plead to the indictment
- c) commit the accused person for trial by the high court and transmit to the registrar of the high court copies of the indictment and summary of the case Section 168(4) if the person committed is on bail granted by any court, without prejudice to his or her right to apply for bail, the bail shall lapse and the magistrate shall remand him or her in custody pending his or trial.

It should be noted that under Section 169, it is within the discretion of the DPP to decide which offences are to be proceeded with under section 168 for trial before the high court or to be tried by a magistrate's court. The DPP can have a case that falls within the jurisdiction of the magistrate's court committed to the high court.

After the person is committed to the high court for his trial, the procedure for trial is almost similar to that of the magistrate's courts except for a few differences.

The provisions relating to the trial procedure in the high court are found under s.60-81 of the TIA and s.83 of the TIA.

Briefly the procedure is as follows;

Section 60 TIA, the indictment shall be read out to the accused by the chief registrar or other officer of the court and shall be explained and interpreted where need for interpretation arises. The accused will then be required to plead to the indictment instantly.

The accused may at this stage plead that he has been previously convicted or acquitted as the case may be, of the same offence or that he or she has obtained the president's pardon for his or her offence. S.61 TIA, if the pleas are denied by the prosecution, the court shall go ahead to determine whether the plea is true in fact and if the court finds that the plea is false, the accused shall be required to plead to the indictment.

If the accused person refuses to plead and just stands mute, or fails to answer directly to the indictment, the court shall if it thinks fit, enter a plea of not guilty on behalf of the accused and such plea shall have the same force as if the accused person had actually pleaded not guilty. S.62 TIA

If the accused pleads guilty, the plea shall be recorded and he or she may be convicted on it.

Proceedings after a plea of not guilty

If the accused pleads not guilty or a plea of not guilty is entered in accordance with s.62, the court shall subject to the provisions of section 66 proceed to choose assessors and try the case. S. 65 TIA

Where the accused pleads not guilty, the court shall as soon as is convenient hold a preliminary hearing in open court in the presence of the accused and his advocate and the advocate for the prosecution to consider such matters as will promote a fair and expeditious trial. S. 66 TIA. At the preliminary hearing, the parties shall agree on the facts, issues, documents and any other matter and the matters agreed shall be reduced into writing in what is called a memorandum of matters agreed which will be read out to the accused in the presence of his advocate.

At the commencement of the trial and after the preliminary hearing has been concluded, each assessor shall take an oath impartially to advise the court to the best of his or her knowledge, skill and ability on the issues pending before the court. S. 67 TIA

The accused person or his or her advocate or the prosecutor may before the assessor is sworn, challenge the assessor for cause on any of the following grounds; presumed or actual partiality, personal cause such as infancy, old age, deafness, blindness or infirmity, his or her character- has been convicted of an offence, his or her inability to adequately understand the language of the court. S.68 TIA

After the assessors have been chosen and sworn in, the prosecution shall open its case against the accused person and shall call witnesses and adduce evidence in support of the indictment. S. 71 TIA.

The witnesses called by the prosecution shall then be subjected to cross examination by the accused person or his or her advocate and to re examination by the advocate for the prosecution. S. 72 TIA.

At the close of the case for the prosecution, the court if it considers that there is no sufficient evidence that the accused committed the offence, shall after hearing the advocate for the prosecution and the defence, record a finding of not guilty. S. 73(1) TIA.

However, if the court finds that there is sufficient evidence that the accused committed the offence, it shall inform the accused of his right to give evidence on his or her own behalf, to make an un sworn statement, to call witnesses in his or her defence. S.73 (2) TIA. The court shall then ask the accused or his advocate if he wishes to exercise any of the rights under the paragraphs and his answer shall be recorded. If the accused indicates that he doesn't wish to exercise any of his rights under the section, the court shall invite the advocate for the prosecution to sum up its case for the prosecution.

The accused person will then open his case, stating the facts or law on which he intends to rely and making such comments on the evidence for the prosecution and the accused person may give evidence on his behalf or make an unsworn statement. The accused or his advocate will then examine its witnesses, if any and after their cross examination and re examination if any, may sum up his or her case. S. 74(1) TIA.

If the accused person adduces evidence that introduces a new matter, the court may allow the prosecution to adduce evidence in reply to contradict that matter S.76 TIA

When the case on both sides is closed, the judge shall sum up the law and the evidence in the case to the assessors and shall require each of the assessors to state his or her opinion orally and shall record each such opinion. The judge said take a note of his or her summing up to the assessors S.82 TIA

The judge shall then give his or her judgment, but in so doing shall not be bound to conform to the opinions of the assessors. S. 82(2) TIA

Where the judge doesn't conform with the opinions of the majority of the assessors, he or she shall state his or her reasons for departing from their opinions in his or her judgment. S.82 (3) TIA

If the accused person is convicted, the judge shall pass on him or her according to the law. S. 82(5) TIA

If the accused is acquitted, he or she shall be immediately discharged from custody unless he or she is acquitted by reason of insanity. S.82 (6) TIA.

The judgment in every trial in the high court shall be pronounced, or substance of the judgment shall be explained, in open court either immediately after the termination of the trial or at some subsequent time, of which notice shall be given to the parties and their advocates. S.85 TIA.

The accused must be present at the time of delivering the judgment and if in custody shall be brought up. S.85 (2) TIA.

S.100 TIA, if the accused is sentenced to death, the court shall inform him of her of the period within which, if he or she wishes to appeal should be preferred.

Under section 40(3) under this section of the viodia has to be conducted for the case of a young child to see to it whether they understand the nature of the proceeding the essence of telling the truth on oath.

In the case of kibaganyi on the issue of a child of tender years, In Francisco Matovu in this case viodia has to be done and also the evidence must be collaborated. In R v Hariss evidence of a young child is not sufficient collaboration.

It is a common practice of court and according to the courts requirements that evidence of the witnesses should be on oath e.g in the case of Wilken the witnesses did not swear in.

In the case of Ndilagu it was noticed that one of the assessors had not sworn in and allegations of him being a brother to the accused it was noted In the case of Kasule, the judge is expected to sum up, directing the assessors on matters of law and In the case of Woolington v DPP in this case it was observed that the burden of proof is with the prosecution and the prosecution is the one required to prove beyond reasonable doubt. This is in accordance with section 101 of the Evidence Act. In the case of Inespilito Wasswa it is a duty of court to direct whether there is a case to answer before calling the defence.

CHAPTER SEVEN



CRIMINAL PROFILING

One of the most widely recognized and practiced subspecialties within forensic criminology is that of criminal profiling. It has a long history, as detailed in Turvey (2008a). It also boasts a small library of distinct literature, with different methods and subspecialties all its own. Criminal profiling is a practice that has seen increasing popular and media attention over the past several decades. It has been depicted in popular fiction such as films like *Silence of the Lambs* (1991) and television programs like *Criminal Minds* (2005–present). It has also been applied in a number of high-profile cases, including the “Washington Snipers” (see Turvey and McGrath, 2005, for an extended discussion of profiling and the media in the D.C. Sniper case). As a result, students of criminology commonly express an interest in studying criminal profiling with a view to becoming profilers themselves. At the same time, many professionals, including criminologists and psychologists, have rather abruptly entered the field by hanging out shingles proclaiming related areas of expertise. The resulting student push and practitioner pull have made it a subject of keen interest, but confusion remains among many. So, while advances have been made in the field and interest is high, there is still much debate about the efficacy of profiling and even fundamental educational

standards. It is the purpose of this chapter to present an overview of criminal profiling and what it involves in relation to the forensic criminologist.

First, we will examine what criminal profiling is, what its goals are, what is necessary to complete a profile, as well as the ways in which a profile may assist with investigations. Second, we will discuss the logic and reasoning utilized by profilers, including the basic theories behind practical approaches to profiling, the differences between inductive and deductive logic, and the methods that use them. Next, we will address the main types of profiling, discuss their strengths and criticisms, and touch on the background knowledge required by the profiler to use each of these methods. Finally, we will address the educational requirements of the profiler and comment on the appropriate pathways necessary within university, the importance of the Socratic method as it relates to studying specific cases, and issues with undertaking short courses. We will also discuss those areas in which the criminologist may be able to provide profiling advice, as well as the perils and pitfalls doing so may present. First, we turn to a broad introduction of profiling, examining definitional issues, goals, and the like.

Trial Phase: A stage of criminal profiling that involves providing information about a crime or series of crimes for which there is a suspected offender.

Victim Exposure: The amount of exposure to harmful elements experienced by a victim.

Victimology: An examination of all aspects of a victim's life, including lifestyle, hobbies, habits, friends, enemies, and demographic features.

What is Criminal Profiling?

Although the practice of criminal profiling has been documented for centuries in different forms (Turvey, 2008a), the term offender profiling was first put into regular use by a small group of FBI analysts. They used it to describe the process of making inferences about offenders' characteristics from their actions during a crime (Canter, 1995). In its most basic form, criminal profiling is an investigative tool that discerns offender characteristics from the crime scene and the behavior of the offenders. It is an inferential process that involves the analysis of offender behavior, their interactions with the crime scene and the victim, and their choices during the crime (Petherick, 2003). Despite its appearing in many of the early works on profiling, the FBI no longer uses the term criminal profiling. This term and others like it, such as criminal personality profiling and psychological profiling, have been deliberately replaced by the general term criminal investigative analysis (CIA).¹ This newer term covers profiling and a number of other services: indirect personality assessments; equivocal death analysis (otherwise known as psychological autopsy, meaning determining from information and evidence gathered whether a death was accidental, natural, suicide, or homicide); and trial strategy. Regardless of the change in labeling, the FBI's methods in this regard remains unchanged. The process of criminal investigative analysis will be discussed in more detail in the inductive methods section later.

GOALS OF CRIMINAL PROFILING

Irrespective of the nomenclature used to describe it, or the actual processes utilized, all methods of profiling have a similar goal. Throughout its application across time, profiling has been designed to help law enforcement develop a viable suspect pool in unsolved crimes, either by narrowing an extensive list of suspects to a small and more manageable group, or by providing new areas of inquiry (Homant and Kennedy, 1998). As noted by Napier and Baker (2005, p. 615), “the purpose of offender profiling is to supply offender characteristics to help investigators narrow the field of suspects based on the characteristics of the crime scene and initial investigative information.” It is not the goal of profiling to identify a particular person or to give his or her identity (Douglas, Ressler, Burgess, and Hartman, 1986), and Muller (2000) notes that the profile will rarely be so accurate as to suggest a certain individual as being responsible.

It has been demonstrated that the newer term was developed to distinguish FBI “profilers” from psychologists with actual education in the behavioral sciences, as well as to facilitate courtroom admissibility of profiling conclusions (Turvey, 2008a).

Nor should it, as determining guilt or innocence of any individual is the task of the trier of fact, not the profiler. Petherick and Turvey (2008a) identify two main phases of profiling, divided by their goals and priorities. The first is the investigative phase, which involves discerning features of the unknown offender for the known crime. It is this phase that will be most aligned to

stereotypical notions of profiling. In the investigative phase, there are seven primary goals (p. 138):

1. Evaluate the nature and value of forensic and behavioral evidence to a particular crime or series of related crimes
2. Reduce the viable suspect pool in a criminal investigation
3. Prioritize the investigation into remaining suspects
4. Link potentially related crimes by identifying crime scene indicators and behavior patterns (i.e., modus operandi [MO] and signature)
5. Assess the potential for escalation of nuisance criminal behavior to more serious or more violent crimes (i.e., harassment, stalking, voyeurism)
6. Provide investigators with investigatively relevant leads and strategies
7. Help keep the overall investigation on track and undistracted by offering fresh insights

The second phase identified is the trial phase, which involves providing information about a crime or series of crimes for which there is a suspected offender. A profile can be useful at this stage of an investigation because it can assist in developing proper interview and interrogation strategies among other things; further, a profile may be used in court as expert evidence to argue for aggravating circumstances and the like, sometimes meaning the difference between life-imprisonment and death penalty cases. Therefore, during the trial phase of an investigation, a profiler's goals are to (Petherick and Turvey, 2008a, p. 138):

1. Evaluate the nature and value of forensic and behavioral evidence to a particular crime or series of related crimes
2. Develop interview or interrogation strategies

3. Help develop insight into offender fantasy and motivations
4. Develop insight into offender motive and intent before, during, and after the commission of a crime (i.e., levels of planning, evidence of remorse, precautionary acts, etc.)
5. Link potentially related crimes by identifying crime scene indicators and behavior patterns (i.e., MO and signature) The goals of profiling may also be dictated in part by the type of crime being profiled and by the needs of the investigative team requesting help.

Also, some crimes are more suited to profiling than others. Therefore, it is also necessary to consider the types of crimes that profiling might assist in and whether a case requires the use of what may be an expensive and time-consuming tool. Generally, it is noted that profiling is most suited to crimes involving psychopathology, or where there is some evidence of psychological dysfunction (McCann, 1992; Pinizzotto, 1984), or in crimes of a sexual nature because they involve more interaction between the offender and the victim (Nowikowski, 1995). Such crimes typically involve murder, rape, arson, and bombing but may also include anonymous letter writing (Davis, 1999; Homant, 1999; Strano, 2004) and other crimes of an unusual, bizarre, violent, sexual or repetitive in nature (Cook and Hinman, 1999; Geberth, 1981; Palermo, 2002; Royal Canadian Mounted Police, 2005; Strano, 2004). It has also been used in hostage negotiations and threats (Davis, 1999; Douglas and Hazelwood, 1986) and assessing suicidality (see Canter, 1999; Homant and Kennedy, 1998; La Fon, 2002). Teten (1989, pp. 366–367) provides this poignant commentary, summing up the issue nicely:

Therefore, while it is theoretically possible to prepare an accurate profile of the perpetrator in any type of crime, it is not feasible. Psychological profiling should be utilised only in those types of crimes where the crime-scene investigation is as complete and thorough as possible.

As a practical matter, this procedure can be expected to provide usable data in only a few highly specific types of crimes. Even then, it is totally dependent upon the psychological value of the evidence collected. Most of the offences, to be appropriate for profiling, must feature some form of overt sexual activity or a loss of contact with reality. Generally speaking, the types of crimes in which profiling has been most successful include:

Homicides that involve sexual activity, or appear to be sex related
Forcible rapes
Sexual molestations
Indecent exposures
Some forms of arson
Homicides involving the parents, children or a majority of the members of a family
Deaths by hanging
These are not the limits of the application of profiling, however, and it has also been applied to more esoteric areas, such as intrusion management in computer security (see Schlarman, 1999), threat management in stalking (see Petherick, 2008), and premises liability in civil actions (see Kennedy and Homant, 1997; explained further in Chapter 8). Regardless of the fact that profiling can be and has been used to understand a broad range of criminal behaviors, it should be noted that the goals of profiling remain consistent—to narrow the suspect pool, provide new areas of inquiry, keep the investigation on track and undistracted, and understand the behaviors more completely.



INPUTS AND OUTPUTS OF CRIMINAL PROFILING

To successfully complete a profile in a given case, a variety of information may be required, depending on the method used. This ranges from statistical data regarding past crimes, to physical evidence and witness statements, to the reconstruction and interpretation of offender behavior. Ostensibly, the more complete this information, the more accurate profiling inferences can be. If the information is incomplete or incorrect, depending on the profiling method used, certain characteristics may be impossible to determine; at the very least it may seriously undermine the veracity of the conclusions. Therefore, it is generally true that more information is better. For example, the first stage of the FBI method is profiling inputs, and describes those elements necessary to compile the assessment (see Douglas, Ressler, Burgess, and Hartman, 1986). These elements include a complete synopsis of the crime, location, weather conditions, and complete victim information including domestic setting, employment, reputation, and criminal history. Forensic information relevant to the crime is also necessary; autopsy reports, photographs and toxicology, as well as crime scene photographs of the area and crime scene sketches to help provide an overall picture.

However, it may not be said that a limited amount of evidence will produce a limited profile in every case. Some profilers show constraint with the information or outputs they provide in their profiles, whereas others are considerably more liberal in their estimates. This liberalism is typical of inductive methods

which focus more on offense generalizations, and not necessarily on the available evidence, resulting in a broader range of characteristics offered. Inductive methods will be discussed thoroughly later. Turvey (2008b) is an example of someone who is more conservative in his approach. He argues that in most cases, during the investigative phase only about four relevant offender characteristics can be deductively inferred from crime scene behavior. These are Criminal Skill, Knowledge of the Victim, Knowledge of the Crime Scene, and Knowledge of Methods and Materials.

Although other characteristics are potentially inferable, they are considered less relevant to investigative needs by virtue of failing to narrow the suspect pool or failing to discriminate from the general public, thus not allowing for new avenues of inquiry to be proposed. However, Turvey (2008b) notes that although only four characteristics are relevant to determining a suspect, after that person is located (during the trial phase), there will be additional questions of forensic interest regarding the crime scene and offender that may be of further value to the court. At the other end of the spectrum is Geberth (1996), who provides an exhaustive list of those things he believes can be determined from the crime, including:

1. Name
2. Age
3. Sex
4. Race
5. Height and weight
6. Marital status a. Children, ages and sex b. Wife, pregnant and recent birth

7. Education level
8. Socioeconomic status
9. History of, and type of, sexual problems
10. Physical abnormalities and/or defects such as a. Acne, speech impediment, obese, walks with a limp, etc.
11. Residence, condition of, etc.
12. Automobile, condition of, etc.
13. Behavior including any noticeable change recently and describe
14. Mannerisms and personality
15. Employment, recently laid off? Skills associated with job?
16. Day or night person?
17. Users of drugs or alcohol, recent increase?
18. Dress, sloppy or neat? Type of clothing?
19. Known to carry, collect, or display weapons? What type?
20. Rigid versus flexible personality This list is consistent with Ault and Reese (1980) and O'Toole (2004), who provide exhaustive lists of inferable offender traits and emotional states, covering almost every facet of their past, present, and future.

It should be noted, however, that the means for inferring these broader and less investigatively relevant traits is typically through comparison to past offenders who committed similar crimes, and not through a process of case-based deduction. The problems inherent in this process will become clear in the following section discussing how profilers may render their findings.

LOGIC AND REASONING IN THE METHODS OF CRIMINAL PROFILING

The following sections will briefly introduce readers to the logic and reasoning used within profiling before covering the major approaches to profiling that are available. Far from being an in-depth exposition, these sections seek to provide readers the necessary and relevant points of each. For a more in-depth treatment of these matters, readers should consult Petherick (2003), Petherick (2005), and Petherick and Turvey (2008b).

Logic and Reasoning

Before considering the different methods of criminal profiling, we need to canvass some fundamental issues related to logic and reasoning. The reason is that, regardless of profiling method used, they differ most according to the way in which the final conclusion is rendered. It could be said that there are predominantly two types of logic used: the first is inductive and the second is deductive. Inductive methods are those relying on statistical or correlational reasoning, and these methods will be discussed forthwith. The final method, Behavioral Evidence Analysis, is deductively oriented and will be discussed in “Deduction: The Suggested Approach” section later. The science of logic is variously defined, and in the broadest sense it is the process of argumentation. As Farber (1942, p. 41) argues, logic is “a unified discipline which investigates the structure and validity of ordered knowledge.” According to Bhattacharyya (1958, p. 326):

Logic is usually defined as the science of valid thought. But as thought may mean either the act of thinking or the object of thought, we get two definitions of logic: logic as the science (1) of the act of valid thinking, or (2) of the objects of valid thinking. Stock (2004, p. 8) suggests:

Logic may be declared to be both the science and the art of thinking. It is the art of thinking in the

same sense in which grammar is the art of speaking. Grammar is not in itself the right use of words, but a knowledge of it enables men to use words correctly. In the same way a knowledge of logic enables men to think correctly or at least to avoid incorrect thoughts. As an art, logic may be called the navigation of the sea of thought. It is the purpose of logic to analyze the methods by which valid judgements are obtained in any science or discourse, which is met by the formulation of general laws that dictate the validity of judgements (Farber, 1942). Without a solid foundation in logic and reasoning, the criminologist cannot proceed competently.

INDUCTIVE CRIMINAL PROFILING

An inductive argument provides a conclusion (or offender characteristic) that is made likely, or a matter of probability, by offering supporting argumentation. In profiling, this support often includes things like physical and behavioral evidence, research findings, or even profiler experience and expertise. A good inductive argument will provide strong support for the conclusion offered, but this still does not make the argument necessarily correct. In reality, even the best inductive argument is a generalization, hypothesis, or theory awaiting verification through testing (Turvey, 2008a). Although inductive generalizations

may be true in some even many—cases, there is no way to guarantee that they will apply to the case being profiled. A key identifying feature of inductive profiles is the use of qualifiers, such as probably, may be, or typically, among others, highlighting the probabilistic nature of the assessment. For example, crime figures from the United States (Federal Bureau of Investigation, 2002) provide that approximately 90% of offenders who committed murder in that year were male. Even though this relationship is relatively strong, it still does not mean that a male will have committed every homicide in that year. As it stands, this statistic could be used to make the inductive argument that an offender in a given case is more likely, or even probably, a male, all else being equal. That is, a profiler using an inductive method may state “the offender in this case is most likely male.” However, this argument based on nationwide statistics could very easily be wrong. This happens because in the examination of individual cases, all things are not equal. The likelihood of an offender being male changes based on a variety of factors, including the type of offense, the type of weapon used, and the sex of the victim, to name but a few, and even taking these things into account does not guarantee the accuracy of the predicted characteristic (in this case, the sex). Therefore, looking narrowly at just the issue of male versus female homicide offenders doesn’t accurately reflect the complexity that will exist in the context of a real case. Apart from context, two of the issues which may seriously impact on the generalizability of any statistical data used to generate inductive theories are sample size and research methodology. This is perhaps best illustrated by a specific FBI study (Burgess and Ressler, 1985) that originally set the stage for the subsequently

developed method of profiling. The study, which was the basis for the FBI's entire profiling method, involved only 36 offenders (not all of whom were serial offenders). Furthermore, the methodology of the study was heavily criticized by the peer reviewers who noted, among other things, small sample size (Burgess, 2003) and a lack of inter-rater reliability (consistency between different individuals rating the offender) (Fox, 2004). Others have been critical of this study as well, with Canter (2004, p. 6) noting that "the FBI agents conducting the study did not select random or even a large sample of all offenders."

The FBI, being very much aware of the limitations of its inductive profiling methods, provides more than a qualifier with its criminal investigative analysis reports (profiles). It actually goes so far as to provide a broad disclaimer at the beginning of each investigative profile. While the wording may vary, the theme is consistent, with the following example being representative (Vorpapel and Harrington, 1998, p. 62):

It should be noted that the attached analysis is not a substitute for a thorough and well-planned investigation and should not be considered all inclusive. The information provided is based upon reviewing, analysing, and researching criminal cases similar to the case submitted by the requesting agency. The final analysis is based upon the probabilities, noting, however, that no two criminal personalities are exactly alike, and therefore the offender at times may not always fit the profile in every category. This standard FBI disclaimer signals the weakness of purely inductive profiling methodologies.

Inductive Methods of Criminal Profiling

The following is a basic primer on the major forms of inductive profiling methodology.

Criminal Investigative Analysis

Without doubt, the best known method of criminal profiling is that of the FBI, known variously as criminal investigative analysis (CIA) and crime scene analysis. This approach arose primarily from the study mentioned previously, which was conducted between 1979 and 1983, with the research focus on the development of typologies from an examination of various features of crimes perpetrated by incarcerated sexual murderers (see Burgess and Ressler, 1985). The goal was to determine whether there are any consistent features across offenses that may be useful in classifying future offenders (Petherick, 2005). A number of publications have arisen from this original research, including Burgess, Hartman, Ressler, Douglas, and McCormack (1986); Ressler and Burgess (1985); Ressler, Burgess, and Douglas (1988); Ressler, Burgess, Douglas, Hartman, and D'Agostino (1986); and Ressler, Burgess, Hartman, Douglas, and McCormack (1986).

The study resulted in an organized/disorganized dichotomy, which became the FBI profiling method. This dichotomy classifies offenders by virtue of the level of sophistication, planning, and competence evident in the crime scene. An organized crime scene is one with evidence of planning, where the victim is a targeted stranger, the crime scene reflects overall control, there are restraints

used, and aggressive acts occur prior to death. This suggests that these offenders are organized in their daily life with the crime scene being a reflection of their personality, meaning they will be average to above average in intelligence, be socially competent, prefer skilled work, have a high birth order, have a controlled mood during the crime, and may also use alcohol during the crime. A disorganized crime scene shows spontaneity, where the victim or location is known to the offender, the crime scene is random and sloppy, there is sudden violence, minimal restraints are used, and there are sexual acts after death. These characteristics are again suggestive of the personality of these offenders, with disorganized offenders being below average in intelligence, being socially inadequate, having a low birth order, having an anxious mood during the crime, and involving the minimal use of alcohol during the offense. Despite having these mutually exclusive classifications, it is generally held that no offender will fit neatly into either category, with most offenders being somewhere between the two; these offenders are called “mixed.”

Despite suggestions that the organized and disorganized terminology was an outgrowth of the study conducted in the late 1970s and early 1980s and published in 1985, it had actually been in use for some time. The terminology first appeared in its original form of organized nonsocial and disorganized asocial in “The Lust Murderer” in 1980 (see Hazelwood and Douglas, 1980). As such, the study is best thought of as further developing an existing concept rather than generating a new one.

Like virtually all the profiling methods, CIA is composed of a number of steps or stages in which information about the offense is gathered, and determinations are made about its relevance and meaning. Despite the fact that an articulated methodology is available, there is much anecdotal evidence to suggest that protagonists of the FBI method do not adhere strictly to all steps or stages. Furthermore, many FBI employed and trained “profilers” are generally not qualified to perform certain analyses proposed as part of the method (for example, crime scene reconstruction; see Chisum, 2000; Superior Court of California, 1999). In theory, CIA is a six-step method, though in reality it is five steps with the sixth step involving the arrest of an offender if one is identified. These first five steps are profiling inputs, decision process models, crime assessment, criminal profile, and investigation. The final phase (ostensibly the sixth) is apprehension. Douglas and Burgess (1986, p. 9) suggest a seven-step process that is “quite similar to that used by clinicians to make a diagnosis and treatment plan.” These seven steps are:

Evaluation of the criminal act itself

- Comprehensive evaluation of the specifics of the crime scene(s)
- Comprehensive analysis of the victim
- Evaluation of preliminary police reports
- Evaluation of the medical examiner’s autopsy protocol
- Development of profile with critical offender characteristics; and
- Investigative suggestions predicated on the construction of the

■ profile The FBI method is one of the most prevalent today; however, despite (or perhaps owing to) its widespread use, this method of profiling has suffered the most criticisms, including:

■ The mythology of the FBI profiling unit has led some to suggest the hype is ill deserved (Jenkins, 1994) and enjoys little in the way of a scientific framework or scrutiny (Canter, Alison, Alison, and Wentink, 2004).

■ Its popularity may be a function of simplicity in that it requires little or no training or knowledge to apply the prefabricated offender templates to current cases (Petherick, 2005; Turvey, 2008a).

■ A number of case dynamics might influence the level of organization or disorganization evident in a case. This includes evidence dynamics, an offender under the influence of controlled substances, an interrupted offense, anger-motivated offenses, or staged crimes (Turvey, 2008a).

■ The method simply reduces offender behavior to a few observable parameters (Turvey, 2008a).

■ The original study on 36 offenders was considerably flawed and criticized heavily by the peer reviewers (Fox, 2004).

■ The classifications were seemingly made on the basis of information about the offenders and the crime scene involved (Homant and Kennedy, 1998) according to the offenders themselves.

■ Most offenders will be neither organized nor disorganized, but will fall somewhere between the two extremes (Ressler and Schachtman, 1992) although this “mixed” category is less helpful to investigators because this

decreases discrimination between types of offenders (Baker, 2001) and presents a problem because the two categories are supposedly discrete.

■ The casework of FBI profilers has been heavily criticized in individual cases (see Darkes, Otto, Poythress, and Starr, 1993; Fox and Levin, 1996; Investigations Subcommittee and Defense Policy Panel of the Committee on Armed Services, 1990; Kopel and Blackman, 1997; Thompson, 1999; Turvey, 2008a).

As a conclusion to criminal investigative analysis, let us consider the skills required in various domains to be able to apply this model. The following chart outlines possible background knowledge and experience which may be necessary to profiling, and whether it is required for this method specifically. A similar chart will be used to describe the background knowledge necessary to apply each method, to assist in conceptualizing and comparing the abilities and strengths of profilers using various types of profiling:

Helpful Analytical logic Unnecessary Diagnostic Evaluations Diagnostic evaluations (DEs) do not represent a single profiling method or approach, but instead are generic descriptions of the services offered by psychologists and psychiatrists relying on clinical judgment in profiling offenders (Bradley, 2003). These evaluations are done on an as-needed basis (Wilson, Lincoln, and Kocsis, 1997) usually as one part of a broad range of psychological services offered by that individual. Historically, some of the earliest examples of profiling available are diagnostic evaluations, and prior to the formation of the FBI's Behavioral Sciences Unit, police sought the advice of psychologists and psychiatrists on particular crimes with varying results (Towl and Crighton,

1996). In modern terms, the contribution of mental health experts to investigations took shape when various police forces asked if clinical interpretations of unknown offenders might help in identification and apprehension (Canter, 1989). Even though other profiling methods have come to the fore, Copson (1995) claims that over half of the profiling done in the United Kingdom is conducted by psychologists and psychiatrists using a clinical approach. In a study of the range of services offered by police psychologists, Bartol (1996) found that, on average, 2% of the total monthly workload of in-house psychologists was spent profiling, and that 3.4% of the monthly workload of part-time consultants was spent criminal profiling. It is not these results that are of particular interest, however, but that 70% of those surveyed did not feel comfortable giving this advice and felt that the practice was extremely questionable. Furthermore (Bartol, 1996, p. 79),

One well-known police psychologist, with more than 20 years of experience in the field, considered criminal profiling “virtually useless and potentially dangerous.” Many of the respondents wrote that much more research needs to be done before the process becomes a useful tool. Without a clear and identifiable process, these evaluations are a little more idiosyncratic and rely to a large degree on the background of the individual compiling them. One’s education, training, and experience dictate the approach taken at a given point in time, with the profile being an outgrowth of the clinician’s understanding of criminals and criminal behavior, personality, and mental illness (Gudjonsson and Copson, 1997). Developmental and clinical issues play a considerable role in DE profiles, and Jackson and Bekerian (1997) dedicate a discussion in their

work to these areas, focusing heavily on the application of personality theory to profiling. Boon (1997) describes how psychoanalytic/ psychodynamic, learning, dispositional/ trait, humanist/ cognitive, and alternative/ Eastern philosophies affect case assessment. To illustrate how personality theories apply to profile compilation, Boon supplies several cases of extortion to which specific personality characteristics are applied. He concludes that the feedback given in the profile will always be reflective of the psychological framework employed by the clinician, with those employing a psychoanalytic background offering advice typical of the Freudian paradigm and so on. Badcock (1997, p. 10) similarly discusses some of the background issues to offender development (i.e., developmental issues) and clinical issues (such as the prevalence of mental illness in offending populations):

Where developmental issues are great enough and begin early enough, they can change the entire concept of what is “normal” for an individual. Everyone tends to assume that what they are used to must be normal and some people grow up with what most others would consider abnormal ideas of the meaning of normality. People who have been seriously abused from an early age, for example, can grow up believing that abuse is the basis of normal relationships. They may have great difficulties in relating to others in ways that do not include abuse and some of them will become abusers themselves. The implication is that, as these issues have the potential to impact on later behavior by the individual, it is necessary for profilers to have the capacity to understand how these manifest in behavior. Specific issues cited include jealousy, envy, control, power, sadomasochism, fantasy, and paraphilias. Turco (1990), in a

widely cited article, provides his own adaptation of the diagnostic approach through psychodynamic theory. Turco is critical of anyone without clinical experience (p. 151):

The experienced clinician has an underlying inherent understanding of psychopathology, experience with predictability, a capacity to get into the mind of the perpetrator and a scientific approach without moral judgement or prejudice....The most productive circumstance likely to arise is when the profiler has both clinical (as opposed to academic) training and law enforcement experience. One cannot expect to obtain a graduate degree and make accurate predictions in the absence of a sound theoretical basis or clinical experience. In examining the role of forensic psychiatrists, McGrath (2000, p. 321) provides the following reasons why they may be particularly suited to providing profiles:

Their background in the behavioral sciences and their training

- In psychopathology place them in an enviable position to deduce personality characteristics from crime scene information.

The forensic psychiatrist is in a good position to infer the meaning

- Behind signature behaviors

- Given their training, education, and focus on critical and analytical thinking, the forensic psychiatrist is in a good position to “channel” their training into a new field. Although these may seem obvious areas in which forensic mental health specialists can apply their skills, McGrath also notes that any involvement in the profiling process should not revolve around, or focus on,

treatment issues. It is here that we shall turn to the criticisms of diagnostic evaluations:

- Mental health officials must not fall prey to “role confusion” (McGrath, 2000; Petherick, 2006, p. 45) and give treatment advice while attempting to derive the characteristics of the offender.
- While learning and personality theories may play a role, it is difficult, if not impossible, to determine the degree to which they apply in a given case until a structured clinical assessment with the perpetrator is undertaken by a mental health professional.
- Many clinicians have no investigative experience and so there may be a disconnect between the perceived and actual requirements of an investigation (see Ainsworth, 2001; Canter, 1989; Dietz, 1985; West, 2000; Wilson, Lincoln, and Kocsis, 1997).
- There is a reliance on indirect methods of assessment, including intuition, psychodynamic theories, and statistical reasoning (Gudjonsson and Copson, 1997).
- Without a unified approach, theory, or process, diagnostic evaluations may be hit-and-miss, and any attempts to study the underlying reasoning or logic behind these profiles may be hampered by the inability to reproduce the train of thought that led to profile characteristics. The following chart provides a list of the necessary background knowledge and experience required to perform a diagnostic evaluation.

Investigative Psychology

The main advocate of investigative psychology (IP) is David Canter, a British psychologist who promotes a scientific-research-based approach to the study of offender behavior. Investigative psychology is an inductive approach and is dependent on the amount of data collected (McGrath, 2000). Although sample size is a problem for some inductive methods, Canter is constantly carrying out research to improve the samples on which conclusions are based, and rigorous social scientific methods to expand knowledge are employed (Egger, 1998; Petherick, 2003). As a result, the conclusions are still inductive but based on more empirically robust evaluations.

As with the FBI approach, investigative psychology identifies profiling as only one part of an overall methodology. This is explained in Canter (2000, p. 1091):

The domain of investigative psychology covers all aspects of psychology that are relevant to the conduct of criminal and civil investigations. Its focus is on the ways in which criminal activities may be examined and understood in order for the detection of crime to be effective and legal proceedings to be appropriate. As such, investigative psychology is concerned with psychological input to the full range of issues that relate to the management, investigation and prosecution of crime. It is further explained in Canter (2004, p. 7):

The broadening and deepening of the contributions that psychology can make to police investigations, beyond serial killers and personality profiles, to include the effective utilisation of police information, through interviews and from police records, as well the study of police investigations and decision

support systems has led to the identification of a previously unnamed domain of applied psychology... called...Investigative Psychology. According to the program's Web site, investigative psychology provides the following:

A scientific and systematic basis to previously subjective approaches to all aspects of the detection investigation and prosecution of crimes. This behavioral science contribution can be thought of as operating at different stages of any investigation, from that of the crime itself, through the gathering of information and on to the actions of police officers working to identify the criminal then on to the preparation of a case for court.

Canter (1998, p. 11) has also gone to great pains to differentiate IP from "every-day" profiling:

So, should psychologists be kept out of the investigation of crimes? Clearly as the Director of the Institute of Investigative Psychology I do think that psychologists have much to offer to criminal and other investigations. My central point is to make a distinction between "profiling" and Investigative Psychology.

Further, to distinguish between IP and those idiosyncratic profiling approaches, the following is noted (Canter, 1998, p. 11):

Investigative psychology is a much more prosaic activity. It consists of the painstaking examination of patterns of criminal behavior and the testing out of those patterns of trends that may be of value to police investigators.... Investigative psychologists also accept that there are areas of criminal behavior that may be fundamentally enigmatic.

This method, commonly referred to as the five-factor model, has five main components that reflect an offender's past and present. These are interpersonal coherence, significance of time and place, criminal characteristics, criminal career, and forensic awareness. These components will be addressed in turn.

Interpersonal coherence refers to the way people adopt a style of interaction when dealing with others, where crime is an interpersonal transaction involving characteristic ways of dealing with other people (Canter, 1995). Canter believes that offenders treat their victims in a similar way to that in which they treat people in their daily lives; that is, criminals carry out actions that are a direct extension of the transactions they have with other people (Wilson and Soothill, 1996). For example, a rapist who exhibits selfishness with friends, family, and colleagues in daily life will also exhibit selfishness with victims. Similarly, an offender may select victims who possess characteristics of people important to him or her (Muller, 2000). This belief is not unique to IP, and most profiling approaches rely on the notion of interpersonal coherence in developing offender characteristics (Petherick, 2003).

As "interpersonal processes gain much of their psychological nuance from the time and place in which they occur" (Canter, 1989, p. 14), time and space considerations should also be reflective of some aspects of the offender. That is, the time and place may be specifically chosen by the offender and so provide further insight into his or her actions in the form of mental maps. The implication is that "an offender will feel more comfortable and in control in areas which he knows well" (Ainsworth, 2001, p. 199). Two considerations are important: the first being the specific location, and the second being the general

spatial behavior which is a function of specific crime sites (Canter, 1989). Canter (2003) dedicated a whole work to these aspects that are largely based on the foundational theory of environmental criminology.

Next, criminal characteristics provide investigators with some idea about the type of crime they are dealing with. The idea is to determine “whether the nature of the crime and the way it is committed can lead to some classifications of what is characteristic...based upon interviews with criminals and empirical studies” (Canter, 1989, p. 14). This is an inductive component of the approach and, as it stands, is similar to attempts made by the FBI in applying an organized/disorganized typology. Studying a criminal career provides an understanding of the way offenders may modify behavior in light of experience (Nowikowski, 1995).

There is room for adaptation and change, with many criminals responding to victim, police, or location dynamics owing to learning and experience. This adaptation and change may be reflective of past experiences while offending. For example, a criminal may bind and gag a current victim, based on the screams and resistance of a past victim (Canter, 1989). This may reflect the evolution of MO displayed by many offenders who learn through subsequent offenses and continue to refine their behavior. Additionally, the nature and types of precautionary behaviors may provide some insight into whether the offender has experience with or exposure to investigative practices. Finally, forensic awareness may show an increase in learning based on past experience with the criminal justice system. Perpetrators may be sophisticated in that they will use techniques that hinder police investigations, such as wearing a mask

or gloves or through attempts to destroy other evidence (Ainsworth, 2000). A rapist may also turn to using condoms to prevent the transfer of biological fluids for DNA analysis. Further, five characteristics utilized in the IP method may be instructive to investigators. They are self-explanatory and include residential location, criminal biography, domestic/social characteristics, personal characteristics, and occupation/education history (Ainsworth, 2000). While there is not necessarily any greater weighting placed on any of these profile features, Boon and Davies (2003) suggest that research from the United Kingdom identifies residential location and criminal history as the most beneficial, whereas domestic, social, occupational, and educational characteristics are of least value (again highlighting the emphasis IP places on crime geography). The following criticisms could be made of investigative psychology:

- The rigorous reconstruction of offender behavior is not undertaken, so the meaning of behavior may be questionable.
- The generalization of past cases to the current case is dangerous and potentially misleading.
- Offender characteristics are only a possibility, and nothing concrete or specific about the current case is offered.
- IP assumes that the research on a particular crime type is valid to the crime type (general research on murder versus specific research on domestic homicide) and to the crime under consideration (that the probabilities within the research apply to the extant case). The following chart provides the

background requirements necessary for those practicing investigative psychology.

The suggested approach in profiling terms, Behavioral Evidence Analysis (BEA) is the most recent of the individual profiling methods. The method was developed by Brent Turvey in the late 1990s. It is based on forensic science and the collection and interpretation of physical evidence, and by extension what this means about an offender. BEA is primarily a deductive method and, as a result, will not make a conclusion about an offender unless specific physical evidence exists that suggests the characteristic. This means that, instead of relying on averaged offender types, BEA profilers conduct a detailed examination of the scene and related behaviors and argue from these what offender characteristics are evidenced in the behavior and scene. The strength of BEA lies in the fact that the profiler works only with what is known; nothing is assumed or surmised (Petherick, 2003), and a great deal of time is spent determining the veracity of the physical evidence and its relationship to the criminal event. In this way, evidence that is irrelevant or unrelated has little evidentiary value and is not given weight in the final analysis. This assists in maintaining objectivity and leads to a more accurate and useful end product. Like its inductive counterparts, BEA involves a number of steps, with each building on previous stages to provide an overall picture. The first stage of BEA is referred to as the forensic analysis and “must be performed on the physical evidence to establish the corresponding behavioral evidence in a case before a BEA profile can be attempted” (Petherick and Turvey, 2008b, p. 135). In this stage all the physical evidence surrounding a case is examined to

assess its relevance and determine its overall nature and quality. This step also ensures the probative quality of the evidence should the case end up in court. Ultimately, the forensic analysis informs the profilers what evidence they have to base a profile on, what evidence may be missing, what evidence may have been misinterpreted, and what value that evidence has in the subsequent analyses. Thornton (2006, p. 37) contextualizes the importance of physical evidence:

We are interested in physical evidence because it may tell a story. Physical evidence properly collected, properly analysed, and properly interpreted may establish the factual circumstances at the time the crime occurred. In short, the crime may be reconstructed. Our principal interest is ultimately in the reconstruction, not the evidence per se.... Also, along with the ethos is an ethic a moral obligation to maintain the integrity of the processes by means of which the reconstruction is accomplished. In short, the ethics of crime reconstruction represents an imperative to “get it right.” “Getting it right” involves more than guessing correctly. It necessitates a systematic process. It involves the proper recognition of the evidence, the winnowing of the relevant wheat from the irrelevant chaff, and the precise application of logic, both inductive and deductive. The process is not trivial. Because this stage relates to the examination of physical evidence, profilers who are not familiar with or qualified to interpret physical evidence should not undertake this task. Instead, they should work with trained professionals whom they trust to examine the evidence on which they are basing their conclusions. The importance of establishing a set of given facts from information given during an investigation

should be apparent, but this information is all too often assumed as correct without question. Two cases that exemplify the pitfalls of working with information that has been gathered and interpreted by others are the investigation of the explosion aboard the USS Iowa and the homicide of Joel Andrew Shanbrom, for which brief explanations are provided next.

USS Iowa Investigative story

Early one morning in 1989, Turret Two on board the USS Iowa exploded, killing 47 of the ship's crew (Thompson, 1999). The explosion sent shockwaves throughout the U.S. Navy, with the subsequent investigation revealing dangerous practices, incompetence, cover-ups, and investigative failures, only some of which were related to the explosion and deaths. Given the magnitude of the disaster, the Navy consulted agents from the FBI's Behavioral Sciences Unit to provide some insight into what they felt were the actions of a suicidal homo- sexual by the name of Clayton Hartwig stationed on the ship. In an attempt to provide this insight, the FBI agents used a technique known as Equivocal Death Analysis (EDA) to examine Hartwig. While the EDA was not responsible for first bringing attention to him as the person responsible, it was most certainly responsible for cementing this opinion in the minds of investigators and the naval executive. What followed was a series of events that perpetuated bad judgment and showed just how dangerous it can be to accept at face value information that has not been observed or collected first hand: investigators from the Naval Investigative Service (NIS) started by assuming Hartwig's guilt and then provided this information to the FBI

profilers, whose assessment fed this line of thinking back to the NIS and the Navy. With regards to their analysis, a report of the Investigations Subcommittee of the Committee on Armed Services House of Representatives noted two important issues with the FBI's analysis:

The procedures the FBI used in preparing the EDA were inadequate and unprofessional. As a matter of policy, the analysts do not state the speculative nature of their analyses. Moreover, the parameters that the FBI agents used, either provided to them or chosen by them, biased their results toward only one of three deleterious conclusions. Further biasing their conclusions, the agents relied on insufficient and sometimes suspect evidence. The FBI agents' EDA was invalidated by 10 of 14 professional psychologists and psychiatrists, heavily criticized even by those professionals who found the Hartwig possibility plausible.

The FBI analysis gave the Navy false confidence in the validity of the FBI's work. If the Navy had relied solely on the work of the NIS's own staff psychologist which emphasized that such psychological autopsies are by definition "speculative" the Navy would likely not have found itself so committed to the Hartwig thesis. Despite the questionable nature of the EDA process and its methodology, there were more fundamental concerns about the material on which the analysis was based. The following concerns were also raised by the Investigations Subcommittee about the process and results: Richard Ault (working for the FBI) admitted that the Navy had only provided him with fragments of the evidence assembled against Hartwig. Ault was asked who wrote the poem "Disposable Heroes," a key piece of information on which

Hartwig's alleged homosexuality hinged, and he didn't know. Asked whether the agents were aware that another gunner's mate told Admiral Milligan that another sailor had written the poem, Hazelwood stated that this was immaterial because Hartwig had the potential to see it. The agents were asked if they were aware that David Smith had recanted the testimony used in their EDA, and they claimed they weren't sure what he had recanted. The agents had relied entirely on the information provided to them by the NIS and had not done any interviews themselves.

There were further concerns about the veracity of the information on which the profile was based (Investigations Subcommittee and Defense Policy Panel of the Committee on Armed Services, 1990, p. 42):

The preponderance of material came from interviews conducted and provided to the FBI by the NIS. As the subcommittee found earlier, serious questions were raised about the leading nature or bias introduced in the interviews by the NIS interviewing agents. Some witnesses denied making statements to NIS that are significant to the profile...in at least one instance, the witness recanted several portions of his testimony, but was still considered a valuable witness.

Joel Andrew Shanbrom Another example stressing the importance of not only establishing a set of facts for oneself, but also in assessing evidence dynamics, is the homicide of Joel Andrew Shanbrom, a school district police officer in California. Shanbrom's wife, Jennifer, claimed that she was upstairs bathing their son when she heard an altercation downstairs between her husband and some [black] men. A profile of the alleged offender was compiled by Mark Safarik of the FBI's Behavioral Analysis Unit. Safarik's assessment gave

considerable weight to the apparent ransacking of certain rooms in the house, including that of the son Jacob:

The dressers and night stands in the master bedroom, Gisondi's room, and Jacob's bedroom had been disturbed.... In Jacob's bedroom, a room clearly identified as a child's bedroom, the dresser drawers were pulled out to give the appearance they were searched. Such a room would not be expected to contain any valuables and this would have been passed over by offender(s) looking for valuables. While police had trouble with Jennifer Fletcher's story from the outset, particularly after discovering significant life insurance policies on her husband, the profile remained steadfast to its assessment of someone ransacking the bedroom in an attempt to stage a burglary. It wasn't until later that an expert profiler, in providing trial assistance to the defense, was able to establish through consideration of evidence dynamics that the scene had in fact been altered by a police officer in her search for clothing for Jacob Shanbrom, who was naked and cold from hiding in a bedroom closet with his mother since the alleged homicide. In a postscript to this case, Jennifer and her new husband, Matthew Fletcher, were both charged with the 1998 murder of Shanbrom after facing counts of fraud and conspiracy (Associated Press, 2002; Blankstein, 2002). It is also necessary to establish the accuracy and quality of the information which serves as the basis of the profile because of evidence dynamics. This refers to influences that change, relocate, obscure, or obliterate physical evidence, regardless of the intent of the person or circumstance that bring about the change (Chisum and Turvey, 2008). So, evidence dynamics may be the result of the offender moving from one room to another during an

offense, a bleeding but not yet deceased victim crawling down a hallway, paramedics attending the scene of a violent crime, or firefighters attending a fire scene. However, evidence dynamics is important in the case far beyond the extant circumstances of the crime scene, playing a role from the time the evidence is deposited until the final adjudication of the case (Chisum and Turvey, 2000). To provide some context to the way that evidence dynamics may alter the physical presentation of crime scene actions, consider the following example from Chisum and Turvey (2000, p. 9):

A youth was stabbed several times by rival gang members. He ran for a home but collapsed in the walkway. A photo of the scene taken prior to the arrival of the EMT team shows a blood trail and that the victim was lying face down. Subsequent photos show the 5 EMT's working on the body on his back. He had been rolled over onto the blood pool. It became impossible for bloodstain patterns interpretation to be used to reconstruct the events leading to the death of the youth.

Given these examples, the importance of the forensic analysis and establishing a set of facts for oneself should be clear. Although only three cases have been used as examples, there are numerous others with a similar lack of critical appraisal of the presenting evidence (see also Superior Court of California, 1999). The other aspect of the forensic analysis that is important and factors in evidence dynamics is crime reconstruction, which is "the determination of the actions surrounding the commission of a crime" (Chisum, 2002, p. 81). Popular conceptions of crime reconstruction abound, with some believing the process involves the physical rebuilding of the crime scene in another location.

Saferstein (2004) suggests that “reconstruction supports a likely sequence of events by the observation and evaluation of physical evidence, as well as statements made by witnesses and those involved with the incident.” Rynearson (2002) incorporates “common sense reasoning” and its use with forensic science to interpret evidence as it resides at the crime scene. Cooley (1999, p. 1), in an excellent paper written while a graduate student at the University of New Haven, suggests that crime scene reconstruction is the foundation of the BEA method:

Deductive reasoning, via crime scene reconstruction, can and will provide the profiler with the appropriate information allowing him or her to construct the most logical profile of an unknown offender. This will enable the profiler to supply the requesting agency with investigatively relevant information.

The second stage of the BEA process, victimology, examines all aspects of the victim including lifestyle, hobbies, habits, friends, enemies, and demographic features. The information derived through the victimology can help to determine the existence or extent of any relationship between the victim and the offender. Two other related components of the victimology are victim exposure and offender exposure. Victim exposure refers to the possibility of suffering harm or loss by virtue of an individual’s personal, professional, and social life (Petherick and Turvey, 2008c). This risk is further partitioned into overall exposure (lifestyle exposure) and the exposure present at the moment of victimization (incident exposure). As a general rule, exposure can be low, medium, or high, indicating that a person is at a low exposure by virtue of personal, professional, and social life and so forth. In BEA just as much time

should be spent examining the victim's personality and behavioral characteristics as would be spent assessing the offender. In the third stage, crime scene analysis, the profiler determines such factors as the method of approach and attack, method of control, location type, nature and sequence of any sexual acts, materials used, type of verbal activity, and any precautionary acts the offender engaged in (Petherick and Turvey, 2008b), such as wearing gloves or a balaclava, altering one's voice, or wearing a condom. This stage also sets out to determine what types of crime scenes are involved in a criminal event. They include the point of contact; primary, secondary, and tertiary scenes; and the dump or disposal site. For example, a victim with extensive wounds that would have produced a substantial amount of bleeding is found in an area devoid of bloodstains. This suggests the victim was killed elsewhere (a primary crime scene) and then moved to the scene where the body was found (the dump or disposal site). The final stage is the actual offender profile, known as offender characteristics. All the information from the previous stages is integrated and assessed through deductive reasoning to determine what the physical evidence, victimology, and crime scene characteristics collectively argue about the offender. Turvey (2008b) argues against offering the profile characteristics of age, sex, race, and intelligence because these are typically assessed inductively and not based on physical evidence. As mentioned in the "Inputs and Outputs of Criminal Profiling" section earlier, it is argued that the following four conclusions can be offered deductively and posited with a high degree of confidence:

- Knowledge of the victim

- Knowledge of the crime scene
- Knowledge of methods and materials
- Criminal skill

While BEA is a method relying on deductive logic, it could not, however, be characterized as purely deductive. The reason is that the process of deduction relies in part on induction, which produces theories that may be tested against the evidence. This is confirmed by Stock (2004, p. 5), who writes, “in the natural order of treatment inductive logic precedes deductive, since it is induction which supplies us with the general truths, from which we reason down in our deductive inferences.” Because of the reliance on physical evidence and the reconstruction of the behavior involved in the criminal event, many inductive generalizations will be employed. Wound patterns and victimology are two such examples in which inductions may be used to form the basis of a later deduction. The type of knife used, its width, the length of the blade, and other characteristics of edged weapons have typically been determined through a study of known weapons and their features. However, the application of this knowledge to the particular features of a set of wounds present on a victim’s body involves the deductive application of this knowledge. Petherick (2003, p. 186) presents another example of the application of the reasoning:

If a prostitute is murdered, a principally inductive approach suggests that because of her profession she was at high risk of victimisation. However, a more in-depth deductive approach may determine that she had a small select clientele, was naturally cautious, had taken self defense training, and worked only in established premises. All of these factors work to reduce her risk. There

are no direct criticisms of BEA in the literature, though there is some minor discussion of deductive approaches in general. Most seem to be quite confused by the application of the reasoning (Canter, 2004; Godwin, 1999) whereas others provide some cursory discussion of it but seem unsure of how the overall process operates. Holmes and Holmes (2002, p. 7) note that “much care is taken from the examination of forensic reports, victimology, and so forth and the report will take much longer to develop using only this approach.” These authors seem largely unaware of the finer points of logic, such as induction being a component of and important to the overall process of deduction.

Readers are also left with the distinct impression that the thoroughness of the approach (and the subsequent time involved) is pejorative. A final deductively rendered opinion will rely on inductively derived knowledge, though Holmes and his colleague tend to treat both processes as being dichotomous and largely exclusive. This suggests a fundamental lack of overall knowledge of the processes involved in reasoning. McGrath (2000) has however identified one critical observation of this method, and that is if the initial premises on which conclusions are based are wrong, then the subsequent conclusions will also be wrong. Given that one of the primary purposes of the EFA is to establish the veracity of the premises, this is not necessarily a problem as long as profilers are aware that it is incumbent on them to establish the basic information on which their decisions are based. If the basis of the premises cannot be established, then this may limit the number of characteristics that can be offered (because deductive approaches will derive conclusions only on what has been unequivocally established). Beyond these observations, there has been

little criticism of this approach. The following chart breaks down the background knowledge necessary to use a deductive approach to profiling. Background requirement Research Helpful Law enforcement affiliation Unnecessary Psychology Required Investigative Required Forensic Knowledge Required Analytical logic Required.

DEDUCTIVE CRIMINAL PROFILING

Deductive profiling relies on a more scientific and systematic process whereby offender characteristics are a direct extension of the available physical and behavioral evidence (Turvey, 2008a). If the premises are true, then the conclusions must also be true (Bevel and Gardiner, 1997) (recall in inductive arguments if the premises are true, the conclusion is possible but not necessarily true). Neblett (1985, p. 114) goes further, stating, “if the conclusion is false, then at least one of the premises must be false.” For this reason, it is incumbent on the profiler to establish the veracity and validity of each and every premise before attempting to draw conclusions from them. Because a deductive argument is structured so that the conclusion is implicitly contained within the premise, and unless the reasoning is invalid, the conclusion follows as a matter of course. A deductive argument is designed so that it takes us from truth to truth. That is, a deductive argument is valid if (Alexandra, Matthews, and Miller, 2002, p. 65):

It is not logically possible for its conclusion to be false if its premises are true. Its conclusions must be true if its premises are true. It would be contradictory to assert its premises yet deny its conclusions. In profiling, deduction draws on the scientific method which is a “reasoned step by step procedure involving

observations and experimentation in problem solving” (Bevel, 2001, p. 154). Unlike induction, then, deduction takes the possible hypotheses garnered from statistics and research (the inductive conclusions) and tests them against the physical evidence present in each case. This is undertaken with a view not to prove the hypothesis, but rather to disprove it. That is, each possible characteristic of the offender is tested against the evidence with the goal of falsifying it or proving it to be untrue. If falsified, the inductive hypothesis is dropped or restructured, while those hypotheses that consistently and repeatedly fail to be disproved survive. It is only after this rigorous testing that we can be certain an analysis is complete and truths are arrived at.

Once a hypothesis has consistently withstood falsification, it can be presented in a deductive fashion. It is under this strict procedure of testing and retesting that deductive profiling operates. From an analysis of case inputs, theories are formed inductively and tested against the evidence. After numerous and repeated attempts to disprove the theories, a deductive conclusion can be put forth. However, the profile that results from this process is by no means static and may be updated in light of new information. New physical evidence may be incorporated into the decision process to update the conclusion. Also, new advances in science and understanding may challenge long-held assumptions and question the current hypothesis. Although it may appear as such, this is not a problem with the process because a deduction can operate only within the realm of established laws and principles. This tenet of argumentation is made clear by Farber (1948, p. 48):

Every “logical system” is governed by principles of structure and meaning. A system that claims to be a “logic,” i.e., which operates formally with one of the various definitions of implication, possibility, etc., is subject to the laws of construction of ordered thought, namely, to the fundamental principles of logic. This requirement imposed on all systems cannot amount to a law that there shall be law. The specific application is provided by the rules in each system. When these laws or principles change because of new knowledge, so too must the nature of the deduction made. Armed with an understanding of logic, let us now turn to the inductive methods.

CRIMINAL PROFILING EDUCATION

The issue of profiler education has not been touched upon in any significant way in the literature on profiling, with most discussions revolving around the theoretical paradigm offered by respective authors. That is, those psychologists engaged in the process argue for an educational experience including advanced study in psychology; law enforcement officers engaged in profiling (mostly the FBI and those they train) argue that law enforcement experience is a necessity; those who approach profiling from the perspective of physical evidence argue that a broad-based understanding of physical evidence, its relevance, and meaning is important. The following sections of this chapter will discuss the issues relevant to profiler education, what is required, and where to get it.

Tertiary education

A tertiary education typically involves formal and structured classes in a variety of areas as dictated by the degree program students enroll in. Those taking

psychology will be educated in aspects of human behavior and cognition, from introductory courses on the history of psychology through to abnormal psychology, the neuropsychological basis of behavior, and treatment and assessment. Those taking criminology or criminal justice programs will be exposed to the role, structure, and function of the police, courts, and prisons. Depending on the program, they may also get extensive training in the behavioral sciences in areas that have traditionally been the province of psychology (human behavior and psychological disorders, among others). For those taking accounting or business, students will be taught business administration, entrepreneurship, account and book-keeping, and other business-related activities.

2While it is noted that BEA is a largely deductive method and does not rely on research in developing the final conclusion, research is employed to generate hypotheses that are then tested against the physical evidence which subsequently informs the deductive decision-making process.

The point is this: not all educational experiences are equal, and the degree of instruction one receives in any area related to profiling differs based on a variety of factors. This may be owing to the educational institution or degree program at a broad level, there being critical differences not only among the institutions, but also between two programs even of the same name. Consider the following example: Two universities in the same general location both offer Criminology and Criminal Justice degrees. One is housed within a social science faculty, and the other is located within a law school. In the first program, there is a degree of overlap between criminological offerings and psychological offerings, exposing students to a range of issues relating to human behavior

and cognition. The students in this program will develop a healthy understanding of behavioral science and how this applies to the profiling endeavor. In the latter program, students are taught primarily by legal professionals and theoretical sociologists in such a way that they develop a healthy understanding of policy and procedure as it relates to the legal system. It should be clear that students in the first program would be better placed to consider a career in profiling than students in the second. Staffing may also dictate the quality of a given program, with those staff undertaking research or casework in a given area perhaps being more equipped to provide a holistic education than those approaching any given topic from a purely theoretical point of view. The reason is that they will be better able to understand and subsequently explain the nuances of casework, evidence examination, and report writing. Interested students should seek out a program that not only has a sufficient level of education in the behavioral sciences, but also one that is taught by staff who understand the theory of what they are teaching, why it is important, and how it applies.

With regards to specific areas of study, the following discrete areas of study are suggested:

- Criminology
- Psychology
- Forensic Science
- Law

The areas of criminology and psychology should be self-explanatory and have been covered elsewhere within the chapter. Forensic science is suggested because it will provide a fundamental understanding of the nature of physical

evidence, its identification, limitations, benefits, and interpretation. Because profiling is based on an assessment of behavior, and the behavior is often determined through the lens of the physical evidence, students seeking work in the area would be left wanting in an education that did not encompass some aspect of forensic science.

Law, or at least some understanding of the criminal justice system, expert evidence, and procedure, will be required because profilers, whether private or government employed, are forensic examiners. As such, there is an expectation that they may have to provide evidence in a court of law before a trier of fact. It should also be noted that the subject area under which one decides to study is not the only thing to think about when preparing for work in profiling. Similar to the issues of institutions and programs, all things are not created equal when it comes to studying criminal profiling. Unlike many courses in the criminology field, such as theories of crime courses which have an fairly predictable and consistent curriculum across teachers and universities, not all courses related to profiling are created equal. That is, depending on what school the profiling course is run from, and who teaches it, which aspects of profiling are important, which methods should be utilized, and which issues are most salient will differ. Students should seek out those courses that compare and contrast different methods; that study actual profiles and real cases; and that endorse the scientific method, analytical logic, and critical thinking. As an adjunct to these forms of tertiary study, it is also suggested that profilers engage in short courses. However, there are a number of perils and pitfalls evident in such a practice, as outlined next.



Bricks, mortar, and the Socratic Method

For those who are already working in the criminal justice system or outside it, there is often a desire to return to university to acquire a new or round out an existing education. It has been the authors' experience over the years that there are a variety of reasons why students may return to university, including change of a career, promotion or advancement, interest, or simply to increase their knowledge base. Aside from choosing the right university, program, and staff, students are further presented with a number of other options in terms of full-time or part-time degrees, on-campus, and external programs. Which option to take will be dictated largely by the requirements of the prospective student, availability and commitments to work and family, motivation, and financial means. However, students should not choose a university simply because it meets their time commitments or is affordable; doing so may mean that, in the grand scheme of things, the quality of the program is sacrificed for expedience of completion or because it doesn't unduly stretch the purse strings. The net result is that they spend a given amount of time and energy on a program that means little if anything in terms of their vocational prospects or the quality of the information they receive and bring to bear at a later time.

For busy professionals, their choices may be limited to those programs that offer classes at night or via an external-only option where students are sent class materials, furnished with deadlines in which to submit their work, and contact their instructors through a variety of electronic means. Some distance programs also employ an on-campus option during the semester, often titled a "residential school," where students attend the University Lectures and tutorials

and face time with teaching staff. While this is true in some instances, it does not apply to all distance programs. Unfortunately, in today's competitive educational market, some institutions have watered down their approach to education such that students are never seen, feedback on assessment is scarce, and they are not given the opportunity to engage in any meaningful way with their peers. The most significant aspect of this would be the lack of ability to engage in a question-and-answer environment so as to have the basis of their beliefs questioned, to highlight the flaws in thinking, and to shape their critical thinking skills. This is the province of the Socratic Method. According to Goldberg (2007, p. 18):

The Socratic Method, which takes its name from the process Socrates used to ascertain philosophical truths, exposes the weakness of arguments through a process of relentless inquiry.

While the Socratic Method forces students to think on their feet, it also replicates the tension of standing before a judge in court, knowing he or she can humble you at any moment. "The tension is a necessary part of the learning experience," says University of Chicago law professor Richard Epstein, a proponent of the Socratic Method, who is thought to be one of its most skilled practitioners. The Socratic Method is "an approach to knowledge building and problem solving based on discussion and debate" (Chisum and Turvey, 2007, p. 100). It is process oriented in that it seeks to identify weak assumptions in an argument and, through repeatedly interrogating these assumptions, arriving at a more valid conclusion or answer. It is what the first author refers to as "intellectual Darwinism" a reference to Darwin's theory of evolution whereby weak theories are systematically culled. As a pedagogical tool, the Socratic

Method involves interaction between two or more people where one (usually a lecturer or instructor) asks a question of another (a student or participant). The responses are then queried within a general or specific theoretical framework and any flaws identified. Further questions are then tailored to incorporate the new arguments, and the process goes on. This step-wise procedure for the Socratic Method is identified by Pedersen (2006, p. 1) as it applies to legal reasoning:

Students study cases before class.

In class, the professor calls on a student, with no advance notice.

The student gives a recitation of the facts and the procedural history.

The professor questions the student, probing underlying legal issues, thus forcing the student to identify relevant facts, question assumptions, take a position and argue its defence.

Meanwhile the rest of the class remains attentive by answering the professor's questions in their own mind. The same process may be applied to the process of profiling and crime analysis in the following way regarding motive (the following is hypothetical, but follows general discussions that take place in both authors' classes regarding Criminal Profiling and Behavioral Evidence Analysis): Q: With regards to the case study, let's discuss the motive or motives that are evident in the offender's behavior. A: I think that the motive for the crime was murder. Q: But murder is a term that describes a behavior or penal classification. A motive is a physical or psychological need. So what would you suggest the motive would be? A: (Another student) The motive might be profit, as the offender didn't do anything sexual with the victim. Q: So what evidence do we have that the motive was profit? What would you

expect to find in a profit offense? A: You would expect to see something stolen: money, jewelry, computers, or something of value. There is no evidence that anything has been stolen. Q: So, if nothing has been stolen, is it likely the motive was profit? A: It might be possible that the offense was interrupted, and that the offender didn't have the chance to actually take anything.... If an acceptable answer is reached, then a new question is developed and the process begins again. For a more detailed or complex problem, the process may take minutes or hours, or may even span multiple sessions.³ It should be noted that the process follows along similar lines to the use of the scientific method as a form of inquiry, which is a "way to investigate how something works, or how something happened, through the development of hypotheses and subsequent attempts at falsification through testing and other

During the Behavioral Evidence Analysis class taught by the first author, the students spend 12 weeks working on an actual case file including autopsy reports, crime scene photographs, police brief of evidence, and other material. Each week, the Socratic Method is employed, beginning with basic questions before moving onto more advanced issues, culminating in the students' writing a report on the case outlining their conclusions and reasoning.

Accepted means" (Petherick and Turvey, 2008b, p. 47) Furthermore, the process works in much the same way as dissecting a case for which a criminologist's opinion has been sought. In this way, by utilizing the scientific method, we are essentially teaching students how to pull a case apart, put it back together, and infer conclusions from it. With both authors working in the tertiary education environment, our recommendation to students is that they seek out a relevant education that will better equip them to understand the

range of issues they will face in the analysis of crime and criminal behavior. They should seek out instructors who are actively working, researching, or publishing in the areas they teach; and they should seek this out in an actual institution, with staff who can mentor and challenge them, students with whom they can engage, and educational requirements that will provide them with the theory and practice that will enable them to become tomorrow's practitioners.

Short Courses: perils and pitfalls. There is an inherent attraction in that which requires the least effort; anything that demands less of our time and attention is seen as being of greater significance regardless of that fact that whatever it is may be of lesser value. Because of this tendency toward the path of least resistance, short courses offer a significant attraction for many. A short course is any truncated pathway to education or information that is offered in an intensive mode, often without the enforcement of educational standards or assessment. Before going any further, we need to point out that both authors are advocates of short courses, given the right context and framework. Perhaps one of the best discussions of short courses comes from Chisum (2007, pp. 314–317). While this discussion relates specifically to short courses in bloodstain pattern analysis, the juxtaposition to general criminology should be easy to see: In addition to reading the recommended publications, it is advised that anyone interested in crime reconstruction take a course in bloodstain analysis from a qualified forensic scientist. These courses can be useful for providing certain basic overviews of fundamental concepts. However, depending on the scientific background of the instructor, they may be lacking in certain crucial areas. A true scientist will find that a majority of the short bloodstain classes are lacking with regard to a discussion of accuracy, precision, and significant numbers.

Appreciating these deficiencies is the difference between the technician's pedantic understanding of bloodstains and the forensic scientist's interpretive role in the reconstruction of the crime.

The preceding passage is useful and captures both the benefit and dangers of short courses; they are useful in providing overviews of certain basic concepts, but many such courses are not taught by qualified instructors, and they are by no means a holistic approach to education in any given domain. But don't get us wrong. Many authors in this volume run short courses in many different countries around the world, and these courses do have value. It is the authors' opinion that short courses are useful for a variety of reasons, including the following:

- They provide an overview of certain fundamental concepts.
- They keep students and professionals abreast of new theories and techniques.
- They give potential students an insight into a discrete area so they can make informed choices about future streams of study.
- Short courses can be invaluable for teaching process-oriented tasks.
- Students and professionals can learn a variety of valuable skills through a case study approach that is not always practical in formal tertiary environments. The main point is that a short course, while offering a number of benefits, should be considered only one small part of an overall educational approach; they should not be taken as a standalone. That is, taking one short course on profiling does not qualify a person to represent himself or herself as a profiler, or to actively profile ongoing cases; this would be considered dangerous, irresponsible, and dishonest.

CRIMINAL PROFILING AND THE CRIMINOLOGIST

The argument for the involvement of criminologists in profiling is relatively straightforward on its face. Criminologists are those who, by definition, are involved in the study of crime, so it would seem a natural extension of their other responsibilities. However, the reality is far from this clear. Some criminologists are involved only in research activities, an endeavor that may leave them ill equipped to understand the foibles of human behavior in a practical sense. Some criminologists are involved in other discrete areas, such as crime prevention, victimology, policy and procedure, or purely theoretical areas that will similarly leave them ill equipped in the evaluation of specific criminal acts. Recall from the first chapter, criminologists by their nature come from an array of similarly vast and diverse backgrounds including sociology, anthropology, psychology, psychiatry, law enforcement, or medicine, among others. Some will be able to lay legitimate claim to a stake in the profiling community; some would never even make the attempt; whereas others still will lack the acumen but jump on the bandwagon, so to speak, of an area that is popular among the media, other professionals, and students. Given this, it is necessary to explore a more concrete foundation for education and background requirements for criminologists who want to “try their hand” at profiling. The main suggestion we would offer for criminologists involved in profiling is to ensure that their knowledge is as well rounded and holistic as possible. Just because one is an “expert” in “crime” does not mean that one is an expert in all areas of crime, regardless of what he or she thinks.

As such, the criminologist-profiler should make every effort to educate himself or herself in the areas of behavioral science, physical evidence, and the law. Criminologists should have as detailed knowledge as possible in the different areas in which they will analyze evidence as profilers. This means acknowledging that different kinds of analysis require different experience, education, and training. It also means knowing their own limits and where their work stops and that of another should start. It means not going beyond their own qualifications and abilities, and knowing when to raise their hands for help. It means being cognitively aware enough to understand the limits of what they can and can't do. As suggested by the discussion on profiling inputs earlier, the range of material criminologists-profilers may be expected to deal with is considerable. From autopsy reports, to first response police reports, to crime reconstructions, to witness statements and crime scene photographs, criminologists-profilers needs to know what they are looking at, what they are looking for, how to interpret it, and what it means within the global context of the crime. Lacking in any of these areas will result in nothing less than an incomplete examination of the facts, which will lead to a dangerously incomplete assessment and possible flawed conclusions. So what does all this mean? The answer is simple, but lost on a few overzealous individuals who fail to appreciate what and where their limits are. This doesn't mean that one has to be a forensic pathologist to read an autopsy report, but it does mean that one should know the difference between cause, mechanism, and manner of death. It doesn't mean that one has to be a blood-stain pattern analyst, but it does mean one knows what an angle of impact is, the difference between high and low velocity spatter, and how the surface of an object will affect the

bloodstain pattern. It doesn't mean one has to be a forensic scientist, but it does mean one needs to understand the difference between a positive result, a negative result, and an inconclusive result. So, based on this, criminologists-profilers should work with other professionals they know can be trusted and who produce valid work. They need to know enough of the language to ask educated questions and to understand what a response means in both a theoretical sense and an applied one (that is, how the answer to their questions impacts their analysis and conclusions). If nothing else, this highlights the multidisciplinary and often team-based approach that profilers should take. It also warns us that short course education is not enough and that every person has limits even though we don't often like to admit them.

Criminologists may be well suited to the practice of criminal profiling, provided their education is complete in the sense that it has equipped them to understand the intricacies of offender behavior, including an assessment of the physical evidence that creates the record of it. They may be further suited to profiling because their training and education often involved instruction not only in social sciences, but also in law, so that they understand the limits of expert witnesses and reports. Furthermore, they may be suited to the task of profiling by virtue of the analytical processes they employ in other aspects of their work. This chapter provided students and practicing criminologists with an over- view of criminal profiling, the "inputs" and "outputs" of the process, the nature of logic and reasoning, and the major paradigms involved in profiling. These have included the inductive methods of criminal investigative analysis, investigative psychology, and diagnostic evaluations. The authors have also suggested a preferred theoretical/practical approach in Behavioral

Evidence Analysis, a predominantly deductive method of profiling involving the detailed analysis and reconstruction of physical evidence, victimology, and crime analysis. As criminologists, we have also been warned not to be carried away with our own abilities, but to know the limits of our own analysis and when to seek help. In this way, criminologists-profilers will be able to provide more accurate and forensically oriented assessments of crime and criminal behavior and to assist the police in their investigative decision processes and the trier of fact in their determinations of culpability.

CHAPTER EIGHT



FORENSIC PATHOLOGY

The noun Forensic Medicine has one meaning the branch of medicine that interprets and establishes the medical facts in civil or criminal law cases. Also called as Legal Medicine OR 2. The applied use of medical knowledge or practice, especially pathology, to the purposes of the law, as in determining the cause of death

Forensic medicine is one of the largest and most important area of forensic science. Also called as legal medicine it applies medical knowledge to criminal and civil law.

Areas of medicine that are commonly involved in forensic medicine are anatomy, pathology, and psychiatry.

Objectives of Forensic Medicine The candidate shall be able to;

- ❖ Be aware of laws in relation to medico-legal work.
- ❖ Conduct a competent Medico Legal Autopsy.
- ❖ Collect appropriate evidence pertaining to Cause/Mode/Manner of death and identification of deceased and assailant.
- ❖ Must be able to visit scene of crime.

- ❖ Detect, describe, interpret the observations and conclude the procedure in a technically competent manner.
- ❖ Serve as a future teacher, trainer, researcher and leader in the field of medico-legal faculty.

MEDICAL JURISPRUDENCE

The medical Jurisprudence deals with the relationship of medical man and moral obligation with rest on him.

OR

In medical Jurisprudence, knowledge is the subject and this is concerned with knowledge of law in

relation to the practice of medicine. Legally it deals with those relations, which have significances,

such as;

- ❖ Doctor-Patient Relationship
- ❖ Doctor-Doctor Relationship
- ❖ Doctor-State Relationship

STATE MEDICINE

The state medicine is special field and is concerned with public, community or environmental health. In this field, there is application of medical knowledge to prevent the spread of disease and to save guard the health of general population. A registered Medical Practitioner (RMP) has satisfactory duty to notify to authorities (Public Health Department) the cases of.

- ❖ Births
- ❖ Deaths
- ❖ Notifiable Diseases (Both Bacterial and Viral)
- ❖ Cases of food poisoning

FORENSIC PATHOLOGY

It is special field of “pathology” dealing with the medico-legal investigation of cause of death by doing Autopsy or Postmortem examination under pathological procedures. It is concerned with certain kinds of cases of sudden, unexplained, suspicious, unnatural and violent deaths. In some cases, a full Autopsy is required to determine the cause and manner of death.

I N Q U E S T

In forensic work, inquest means “a legal inquiry into the cause of death when the cause of death is due to suspicious of foul play and not due to natural causes.”

- i. When the person dies, it is necessary to determine the cause of death either natural or unnatural.
- ii. If the death is due to natural means such as thrombosis, cancer, broncho-pneumonic etc. the body is disposed off according to their religious customs and no further investigation is required.
- iii. If the death is due to unnatural means an “Urgent inquiry / investigation” in to cause of death is necessary to punish the criminals.

Such deaths are unnatural or suspicious and notified to authorities for investigation. The following are some examples of Unnatural Death.

- ❖ Suicide, homicide or infanticide
- ❖ Death from accident, poisoning, drug intoxication
- ❖ Death from postoperative shock or hemorrhage
- ❖ Death due to medical negligence
- ❖ Death in police custody, mental hospital, correctional schools

Types of Inquest

There are following types which are as under

- ❖ Police inquest
- ❖ Coroner inquest
- ❖ Magistrate inquest
- ❖ Medical examiner system
- ❖ Continental system

A U T O P S Y A N D P O S T M O R T E M

Autopsy (Autos=self; opis=view) Postmortem (post=after; mortem=death)

Autopsy and Postmortem is a special type of scientific examination of a dead body carried out under the laws of the State mainly for the protection of its citizens and to assist the identification and prosecution of the guilty in cases of unnatural deaths. Irrespective of the condition of the body whether decomposed, mutilated or fragmented. An autopsy performed by a specially trained doctor invariably yields important information.

Objective and Purpose

- ❖ To establish identity of an unknown body.
- ❖ To determine the cause of death, whether natural or unnatural.

- ❖ To determine the mode of death, whether suicidal, homicidal or accidental.
- ❖ To determine time since death.
- ❖ To determine if possible, the place of death.
- ❖ To determine live birth and viability in newly born infant's death.

A U T O M A T I S M I N M E D I C A L P A T H O L O G Y

Non-Insane Automatism

A further qualification must be introduced into any discussion of the importance of the voluntary nature of the actus reus and this concerns 'non-insane automatism'. This has been described as 'a modern catchphrase [to describe] an involuntary movement of the body or limbs of a person' (*Watmore v Jenkins* [1962] 2 QB 572)¹¹. Imagine that a dental patient kicks out whilst recovering from an anaesthetic and injures the dentist. This prima facie is the actus reus of one of the charges contained within the Offences Against the Person Act 1861. The charge could be defeated on the ground not only that the prosecution would be unable to prove the mens rea requirement of the offence but also on the ground that as the act was involuntary the defendant had not committed the actus reus—it took place whilst the defendant was in a state of automatism. Of course, it might be thought that so long as the defendant escapes conviction it does not matter whether this is because the prosecution is unable to prove the existence of either the mens rea or actus reus.

In fact, it does matter because many criminal offences are categorised as offences of strict liability. This means that the prosecution does not have to

¹¹ (*Watmore v Jenkins* [1962] 2 QB 572)

prove mens rea in relation to one or more aspects of the actus reus. If automatism was considered to be a part of the mens rea, it follows that in crimes such as these the defendant might not escape conviction. The basic principles were outlined by Lord Denning in Bratty, drawing support from Lord Sankey LC in Woolmington v DPP [1935] AC 462¹², where he said:

*“...when dealing with a murder case the Crown must prove
(a) death as the result of a voluntary act of the accused and
(b) the malice of the accused...”*

Lord Denning continued: No act is punishable if it is done involuntarily: and an involuntary act in this context— some people nowadays prefer to speak of it as ‘automatism’—means an act which is done by the muscles without any control by the mind such as a spasm, a reflex action or a convulsion; or an act done by a person who is not conscious of what he is doing such as an act done while suffering from concussion or whilst sleepwalking.

In practice, automatism is closely related to the defence of insanity and works within a narrow sphere because any automatic behaviour which results from a disease of the mind results in the actor being found ‘not guilty by reason of insanity’ (as a result of the M’Naghten Rules of 1843 The law distinguishes between ‘external factors’ responsible for the automatic behaviour and ‘internal factors’, the former potentially leading to an acquittal, whilst the latter is liable to result in detention in a secure hospital. Insanity and non-insane automatism are thus mutually exclusive defences. As Nicola Padfield has noted, ‘the legal definition of both automatism and insanity bear little relationship to their

¹² 30Modern Criminal Law

medical counterparts. Indeed, insanity is not a medical concept and automatism only exists in medical texts in relation to some forms of epilepsy' ([1989] CLJ 354). Little wonder that Lawton LJ has described the whole area as a 'quagmire seldom entered nowadays save by those in desperate need of some sort of defence' (Quick [1973] QB 910). The distinction between external and internal factors is supposed to distinguish between those who suffer from 'one-off problems and who pose no future threat to society and those who, due to a continuing medical condition, are likely to experience the problem again and reoffend.

Unsurprisingly, defendants often go to great lengths to avoid pleading the insanity defence and risking committal to a secure hospital. The distinction can and does lead to injustice. In Quick, the defendant was a diabetic charged with causing actual bodily harm whilst in a hypoglycaemic state (low blood sugar) brought on by taking his insulin and failing to eat properly. His defence was that of automatism but the trial judge ruled that the evidence amounted to a defence of insanity. The defendant at this point changed his plea to guilty and was then sentenced. He now appealed on the ground that the judge's ruling was wrong and that a diabetic in a temporary condition of hypoglycaemia was not, whilst in that condition, suffering from any defect of reason from disease of the mind. The Court of Appeal quashed his conviction on the ground that an external factor was in fact responsible for his act, that is, the taking of the insulin. It held that a malfunctioning of the mind does not occur if it is caused 'by the application to the body of some external factor such as violence, drugs including anaesthetics, alcohol and hypnotic influences'.

The court drew a distinction between a person suffering from a hypoglycaemia condition, such as Mr Quick, and a person suffering from a hyperglycaemia condition (excessive blood sugar). The court held that the former case was caused by the external factor of taking insulin whilst the latter was caused by an internal defect (and the fact that it was treated and controlled by insulin was deemed to be irrelevant!) Padfield has posed the obvious question, ‘why should [a] failure to eat be less likely to recur than [a] failure to take...insulin?’ ([1989] CLJ 354, p 356). Sleepwalking is also now regarded as an internal factor (despite Lord Denning’s opinion in Bratty). In Burgess [1991] 2 All ER 769, the defendant and his female friend both fell asleep while watching television in her flat. She awoke to find Burgess attacking her. She screamed and as a result, ‘he seemed to come to his senses’ and showed great remorse. He was charged with wounding with intent and he raised the defence of lack of mens rea because, he said, at the time of the act he was sleepwalking and this constituted non-insane automatism. The trial judge ruled that this amounted to a plea of ‘not guilty by reason of insanity’ and ordered him to be detained in a secure hospital. He appealed on the basis that the judge’s ruling was incorrect. The Court of Appeal dismissed the appeal, Lord Lane CJ stating:

One can perhaps narrow the field of inquiry still further by eliminating what are sometimes called the ‘external factors’ such as concussion caused by a blow on the head. There were no such factors here. Whatever the cause may have been, it was an ‘internal’ cause. The possible disappointment or frustration caused by unrequited love is not to be equated with something such as concussion.

On this aspect of the case, we respectfully adopt what was said by Martin JA giving the judgment of the court in the Ontario Court of Appeal in *R v Rabey* (1977) which was approved by a majority in the Supreme Court of Canada (see [1980] 2 SCR 513, p 519) (where the facts bore a similarity to those in the instant case, although the diagnosis was different): Any malfunctioning of the mind, or mental disorder having its source primarily in some subjective condition or weakness internal to the accused (whether fully understood or not), may be a ‘disease of the mind’ if it prevents the accused from knowing what he is doing, but transient disturbances of consciousness due to certain specific external factors do not fall within the concept of disease of the mind... In my view, the ordinary stresses and disappointments of life which are the common lot of mankind do not constitute an external cause constituting an explanation for a malfunctioning of the mind which takes it out of the category of a ‘disease of the mind’. To hold otherwise would deprive the concept of an external factor of any real meaning.

Epilepsy is also classed as an internal factor. The House of Lords dealt with this condition in *Sullivan* [1983] 2 All ER 673. Mr Sullivan suffered from epilepsy. There had been a period in his life when he was subject to major seizures but medication had lessened their intensity and at the time of the relevant conduct he was proved to suffer minor seizures known as petit mal, perhaps once or twice each week. On the day in question, he was chatting to elderly neighbours when he was suddenly overcome by a seizure. One of the neighbours, a Mr Payne, aged 80, was kicked by the appellant and required hospital treatment. The prosecution accepted that he had no recollection of the events but the trial judge ruled that his defence was one of insanity and not

automatism which Sullivan's counsel had wished to establish. As a consequence of that ruling, the defendant pleaded guilty to assault occasioning actual bodily harm. He appealed against the judge's ruling. Lord Diplock, in giving the decision of the House of Lords, considered the law relating to insanity and held that the word 'mind' in the M'Naghten Rules 'is used in the ordinary sense of the mental faculties of reason, memory and understanding'. Therefore:

If the effect of a disease is to impair these faculties so severely as to have either of the consequences referred to in the latter part of the Rules, it matters not whether the aetiology of the impairment is organic, as in epilepsy, or functional, or whether the impairment itself is permanent or transient and intermittent, provided that it subsisted at the time of the commission of the act. Lord Diplock ended his speech by saying, 'sympathise though I do with the appellant, I see no other course open to your Lordships than to dismiss this appeal' (p 677). In *Bratty*, Lord Denning emphasised that an act is not to be regarded as involuntary if the person was conscious but nevertheless could not control his actions (irresistible impulse) or could not remember after the event exactly what had taken place. There must be a total destruction of voluntary control. In *Attorney General's Reference (No 2 of 1992)* [1994] QB 91, it was alleged that the defendant, a lorry driver, had fallen asleep at the wheel of his lorry and had collided with a stationary vehicle on the hard shoulder of a motorway which resulted in two people losing their lives. He had been driving for some 350 miles and had been at the wheel for approximately six out of the preceding 12 hours. He had taken the regulation meal and rest breaks. His defence was that he had no awareness of what was taking place until the very

last moment due to being in a trance-like state induced by driving for long distances on ‘straight, flat, featureless motorways’. Expert medical evidence supported the contention. The defence claim was that he was in a state of automatism. The trial judge left the defence to the jury, which acquitted. The Attorney General referred to the Court of Appeal the question whether the defence was open to the respondent. The court held that the condition known as ‘driving without awareness’ could not support the defence of automatism. Lord Taylor CJ stated:

In our judgment, the ‘proper evidential foundation’ was not laid in this case by...[the] evidence of driving without awareness... The defence of automatism requires that there was a total destruction of voluntary control on the defendant’s part. Impaired, reduced or partial control is not enough. [Expert evidence] suggested that he would be able to steer the vehicle and usually to react and return to full awareness when confronted by significant stimuli.

The court relied upon the decisions in **Watmore v Jenkins and Robert v Ramsbottom**¹³. In the former case, Winn J referred to the need for ‘such a complete destruction of voluntary control as could constitute in law automatism’, and in the latter case, the court accepted the proposition that ‘one cannot accept as exculpation anything less than total loss of consciousnesses.

In **Broome v Perkins [1987]**¹⁴, the defendant had been charged with driving without due care and attention. He had driven his vehicle erratically for some six miles. His conviction was upheld even though there was evidence to establish that he was suffering from hypoglycaemia (low blood sugar); he must

¹³ *Watmore v Jenkins and Robert v Ramsbottom* [1980] 1 WLR 823

¹⁴ *Broome v Perkins* [1987] Crim LR 271

have been exercising conscious control of the vehicle, albeit imperfectly, in order to have manoeuvred the vehicle reasonably successfully over such a distance. This case had been criticised by the Law Commission (Law Com 177, 1989, Vol 2, para 11.4) and was distinguished in *T* [1990] Crim LR 256). In this case, *T*, a young French woman, stabbed another woman in the course of a robbery. It was later established that she was suffering from post-traumatic stress as a result of having been raped three days prior to her arrest. The Crown argued that she must have had some control over her actions to be able to open the blade of the knife prior to the stabbing. It was held that the case could be distinguished on the basis that *T* had been in a ‘dream’, whereas in *Broome v Perkins* there had been partial control. It is perhaps reassuring that the court thought that the categories of automatism are not closed, although there are no real signs of them being widened.

S e l f - I n d u c e d A u t o m a t i s m

The position in relation to self-induced automatism was originally established in *Quick*. The Court of Appeal held, in the case of a diabetic who had failed to eat properly and who had consumed too much alcohol after taking his insulin, that: a self-induced incapacity will not excuse...nor will one which could have been reasonably foreseen as a result of either doing or omitting to do something, as, for example, taking alcohol against medical advice after using...prescribed drugs or failing to have regular meals while taking insulin. The conviction in that case was reversed on the ground that the defence of automatism ought to have been left to the jury to decide at the trial. As a result of *Bailey* [1983] 2 All ER 503, operation of the ‘prior fault’ doctrine in

automatism is dependent upon whether the crime the defendant is alleged to have committed is classed by the courts as one of specific intent or basic intent. The former is one where the prosecution must establish that the defendant intended to bring about the prohibited result; whereas the latter may be committed recklessly, that is, the defendant has knowingly engaged in risk-taking activity (with the exception of s 1 of the CDA 1971, where recklessness has an alternative, objective meaning).

A defendant cannot be guilty of a crime requiring specific intent if he or she was suffering from automatism, even if it was self-induced. Where the crime is one of basic intent, however, and the automatism was induced by the voluntary consumption of drink or drugs or was otherwise self-induced, then the defendant has no defence, even if the effect of the intoxication was to deprive him of mens rea. This is because subjective awareness on the part of the defendant that, for example, consuming drugs or failing to eat properly may render him uncontrolled, aggressive or unpredictable, amounts to recklessness on his part and thus he is liable for crimes of basic intent where recklessness suffices for the mens rea. Griffiths LJ in *Bailey* stated the law as follows:

The question in each case will be whether the prosecution have proved the necessary element of recklessness...if the accused knows that his actions or inactions are likely to make him aggressive...with the result that he may cause some injury...and he persists in the action or takes no remedial action...it will be open to the jury to find that he was reckless [p 765],

It follows that if the defendant was taking medically prescribed drugs and was unaware that they would make him or her aggressive, then he may be able successfully to plead automatism. In *Hardie* [1984] 3 All ER 848, the defendant

consumed several Valium tablets which belonged to his former girlfriend. He was unaware of the effect of this drug. He started a fire in his friend's flat and was convicted of damaging property with intent to endanger life contrary to s1(2) of the CDA 1971. His appeal was allowed. Parker LJ stated:

In the present instance, the defence was that the Valium was taken for the purpose of calming the nerves only, that it was old stock and that the appellant was told it would do him no harm. There was no evidence that it was known to the appellant or even generally known that the taking of Valium in the quantity taken would be liable to render a person aggressive or incapable of appreciating risks to others or have other side effects such that its self-administration would itself have an element of recklessness. It is true that Valium is a drug and it is true that it was taken deliberately and not taken on medical prescription, but the drug is, in our view, wholly different in kind from drugs which are liable to cause unpredictability or aggressiveness. It may well be that the taking of a sedative or soporific drug will, in certain circumstances, be no answer, for example in a case of reckless driving, but if the effect of a drug is merely soporific or sedative the taking of it, even in some excessive quantity, cannot in the ordinary way raise a conclusive presumption against the admission of proof of intoxication for the purpose of disproving mens rea in ordinary crimes, such as would be the case with alcoholic intoxication or incapacity or automatism resulting from the self-administration of dangerous drugs.

Reform of automatism as a defence

The law is clearly in need of reform in this area. The Butler Committee on Mentally Abnormal Offenders (Report of the Committee on Mentally Abnormal Offenders, Cmnd 6244, 1975) recommended radical reforms and

most of its proposals have been adopted by the Law Commission in its proposed Criminal Code. The Commission's proposals would, if enacted, effectively abolish the distinction between internal and external factors. Clause 33(1) proposes that: A person is not guilty of an offence if:

(a) he acts in a state of automatism, that is, his act:

(i) is a spasm or convulsion; or (ii) occurs while he is in a condition (whether of sleep, unconsciousness, impaired consciousness or otherwise) depriving him of effective control of the act; and

(b) the act or condition is the result neither of anything done or omitted with the fault required for the offence nor of voluntary intoxication.

However, to deal with the defendant who still poses a continuing 'threat' to others, cl 34 provides that a defendant acquitted under cl 33 would be the subject of a 'mental disorder' verdict and the court would still have wide and flexible sentencing powers (which would include the power to compel the individual to receive in-hospital medical treatment). If parliament adopted these proposals, many of the problems experienced by those suffering from some kind of mental disorder, short of insanity, would be alleviated and the defence would cease to be the 'quagmire of law' identified by Lawton LJ in *Quick* as long ago as 1973 (for a detailed analysis of the Law Commission's proposals, see Pt 2 of the proposed Criminal Code (Law Com 177, 1989).

CHAPTER NINE



DNA, THUMBRINTS IN FORENSICS

DNA has proven to be a powerful tool in the fight against crime. DNA evidence can identify suspects, convict the guilty, and exonerate the innocent. Throughout the Nation, criminal justice professionals are discovering that advancements in DNA technology are breathing new life into old, cold, or unsolved criminal cases. Evidence that was previously unsuitable for DNA testing because a biological sample was too small or degraded may now yield a DNA profile. Development of the Combined DNA Index System (CODIS) at the State and national levels enables law enforcement to aid investigations by effectively and efficiently identifying suspects and linking serial crimes to each other. The National Commission on the Future of DNA Evidence made clear, however, that we must dedicate more resources to empower law enforcement to use this technology quickly and effectively.

In 1990, a series of brutal attacks on elderly victims occurred in Goldsboro, North Carolina, by an unknown individual dubbed the “Night Stalker.” During one such attack in March, an elderly woman was brutally raped and almost murdered. Her daughter’s early arrival home was the only thing that saved the woman’s life. The suspect fled, leaving behind materials intended to burn the

residence and the victim in an attempt to conceal the crime. In July 1990, another elderly woman was brutally raped and murdered in her home. Three months later, a third elderly woman was raped and stabbed to death. Her husband was also murdered. Their house was burned in an attempt to cover up the crime, but fire/rescue personnel pulled the bodies from the house before it was engulfed in flames. When DNA analysis was conducted on biological evidence collected from vaginal swabs from each victim, authorities concluded that the same perpetrator had committed all three crimes. However, there was no suspect.

For 10 years, both the Goldsboro Police Department and the crime laboratory refused to forget about these cases. With funding from the National Institute of Justice, the crime laboratory retested the biological evidence in all three cases with newer DNA technology and entered the DNA profiles into North Carolina's DNA database. This would allow the DNA profile developed from the crime scene evidence to be compared to thousands of convicted offender profiles already in the database.

In April 2001, a "cold hit" was made to the perpetrator's convicted offender DNA profile in the database. The perpetrator had been convicted of shooting into an occupied dwelling, an offense that requires inclusion in the North Carolina DNA database. The suspect was brought into custody for questioning and was served with a search warrant to obtain a sample of his blood. That sample was analyzed and compared to the crime scene evidence, thereby confirming the DNA database match. When confronted with the DNA evidence, the suspect confessed to all three crimes.

Mark Nelson, special agent in charge of the North Carolina State Crime Laboratory, said, “Even though these terrible crimes occurred more than 10 years ago, we never gave up hope of solving them one day.”

Every law enforcement department throughout the country has unsolved cases that could be solved through recent advancements in DNA technology. Today, investigators who understand which evidence may yield a DNA profile can identify a suspect in ways previously seen only on television. Evidence invisible to the naked eye can be the key to solving a residential burglary, sexual assault, or murder. The saliva on the stamp of a stalker’s threatening letter, the perspiration on a rapist’s mask, or the skin cells shed on the ligature of a strangled child may hold the key to solving a crime.

In Austin, Texas, for example, an investigator knowledgeable about DNA technology was able to solve the rape of a local college student. Having read about the potential for obtaining DNA evidence from the ligature used to strangle a victim, the investigator requested DNA testing on the phone cord used to choke the victim in his case. He realized that in the course of choking someone, enough force and friction is applied to the rope or cord that the perpetrator’s skin cells may rub off his hands and be left on the ligature.

The investigator’s request paid off in an unanticipated way. In spite of the attacker’s attempt to avoid identification through DNA evidence by wearing both a condom and rubber gloves, a reliable DNA profile was developed from the evidence. During the struggle, the attacker was forced to use one hand to hold the victim down, leaving only one hand to pull the phone cord tight. The attacker had to grab the remaining end of the cord with his mouth, thereby

depositing his saliva on the cord. Although the developed profile came from saliva rather than skin, DNA not only solved the case in Austin, but also linked the perpetrator to a similar sexual assault in Waco.

Without the investigator's understanding of DNA technology and where DNA might be found, the case may have gone unsolved. The successful review and investigation of unsolved cases require the same basic elements as the investigation of new cases: cooperation among law enforcement, the crime laboratory, and the prosecutor's office. Investigators should be aware of technological advances in DNA testing that may yield profiles where previous testing was not performed or was unsuccessful. The crime laboratory can be essential to the preliminary review of unsolved cases, for example, by providing investigators with laboratory reports from previous testing and consultation regarding the investigative value of new DNA analysis techniques and DNA database search capabilities. Additionally, the prosecutor's office should be involved as soon as a case is reopened so that legal issues are addressed appropriately. It is also extremely important that case reconstruction considers the victim or victim's family and the importance of finality to closing a case.

Although DNA is not the only forensic tool available for the investigation of unsolved cases, advancements in DNA testing and the success of DNA database systems have inspired law enforcement agencies throughout the country to reevaluate cases previously thought unsolvable. The purpose of this report is to provide law enforcement with a practical resource for the review of old, cold, or unsolved cases that may be solved through DNA technology and

DNA databases. “The Long and Short of DNA” and “How Can DNA Databases Aid Investigations?” will educate the reader about the science and technology of DNA testing and DNA databases. “Practical Considerations” provides important background information on legal and practical considerations regarding the application of DNA technology to old, cold, or unsolved cases. Finally, a step-by-step process is provided to help investigators select cases that would most likely be solved with DNA evidence. As investigators advance through this process, they should also keep in mind the array of other technology advancements, such as improved ballistics and fingerprint databases, that may benefit their investigation.

ADVANCEMENTS IN DNA TECHNOLOGY

Advancements in DNA analysis, together with computer technology and the Combined DNA Index System (CODIS), have created a powerful crimefighting tool for law enforcement. CODIS is a computer network that connects forensic DNA laboratories at the local, State, and national levels. DNA database systems that use CODIS contain two main criminal indexes and a missing person’s index. When a DNA profile is developed from crime scene evidence and entered into the forensic (crime scene) index of CODIS, the database software searches thousands of convicted offender DNA profiles. The successful review and investigation of unsolved cases require cooperation among law enforcement, the crime laboratory, and the prosecutor’s office.

USING DNA TO SOLVE COLD CASES

Contained in the offender index of individuals convicted of offenses such as rape and murder. Similar to the Automated Fingerprint Identification System (AFIS), CODIS can aid investigations by efficiently comparing a DNA profile generated from biological evidence left at a crime scene against convicted offender DNA profiles and forensic evidence from other cases contained in CODIS. CODIS can also aid investigations by searching the missing persons index, which contains DNA profiles of unidentified remains and DNA profiles of relatives of those who are missing. Because of the recidivistic nature of violent offenders, the power of a DNA data-base system is evident not only in the success of solving crimes previously thought unsolvable, but perhaps more importantly, through the prevention of crime.

When properly documented, collected, and stored, biological evidence can be analyzed to produce a reliable DNA profile year, even decades, after it is collected. Just as evidence collected from a crime that occurred yesterday can be analyzed for DNA, today evidence from an old rape kit, bloody shirt, or stained bedclothes may contain a valuable DNA profile. These new analysis techniques, in combination with an evolving database system, make a powerful argument for the reevaluation of unsolved crimes for potential DNA evidence.

Knowledgeable law enforcement officers are taking advantage of powerful DNA analysis techniques by investigating crime scenes with a keener eye toward biological evidence. The same new approach being applied to crime scene processing and current case investigation can be applied to older unsolved cases. Law enforcement agencies across the country are establishing

cold-case squads to systematically review old cases for DNA and other new leads. This report will serve as a resource to assist law enforcement with maximizing the potential of DNA evidence in unsolved cases by covering the basics of DNA analysis and its application to forensic casework. The report will also demonstrate how DNA database systems, advancing technology, and cooperative efforts can enhance unsolved case investigative techniques.

Advancements in DNA technology have led to significant changes in many States' statutes, which may affect the manner in which unsolved cases are investigated, filed, and prosecuted. Advancements in the technology have been so significant that laws are being created, amended, and even repealed to take advantage of its ability to identify and convict the guilty and exonerate the innocent. Laws regarding DNA admissibility in court, its use in post-conviction appeals, the creation and expansion of databases, and the extension or elimination of statutes of limitation are examples of the quickly evolving impact of DNA on the criminal justice system. Given the legal changes occurring throughout the country, constant contact and consultation with the local prosecutor is critical not only for the investigation of older cases but for all cases in which DNA may be relevant evidence.

D A T A B A S E E X P A N S I O N

The use of DNA evidence and convicted offender DNA databases has expanded significantly since the first U.S. DNA data- base was created in 1989. Although State and local DNA databases established in the early 1990s contained only DNA pro- files from convicted murderers and sex offenders, the undeniable success of DNA databases has resulted in an international trend

toward database expansion. All States require at least some convicted offenders to provide a DNA sample to be collected for DNA profiling and, in 2000, the Federal Government began requiring certain offenders convicted of Federal or military crimes to also provide a DNA sample for the criminal DNA database. Recognizing that the effectiveness of the DNA data- base relies on the volume of data contained in both the forensic index (crime scene samples) and the convicted offender index of CODIS, many States are changing their database statutes to include less violent criminals. Many States are enacting legislation to require all convicted felons to submit a DNA pro- file to the State database. The tendency for States to include all convicted felons in their databases dramatically increases the number of convicted offender DNA pro- files against which forensic DNA evidence can be compared, thus making the data- base system a more powerful tool for law enforcement.

NEW LEGAL APPROACHES

DNA technology and DNA databases have encouraged the development of new approaches to old cases. One such approach is the filing of charges by “John Doe” warrant. These warrants are based on the unique DNA profile obtained from the analysis of unsolved crime scene evidence. Although John Doe warrants are traditionally filed based on the physical description or alias of an unnamed suspect, investigators and prosecutors are now filing charges using the suspect’s DNA profile as the identifier. This innovative approach has allowed charges to be filed that toll and permit old cases to be prosecuted when the person matching the John Doe DNA profile is identified. John Doe DNA

warrants are one way to permit cases to remain active, allowing them the chance to be solved through the DNA database in the future.

The reliability of DNA technology may necessitate the reevaluation of statutes of limitation because DNA is the fundamental building block for an individual's entire genetic makeup. It is a component of virtually every cell in the human body, and a person's DNA is the same in every cell. That is, the DNA in a person's blood is the same as the DNA in his skin cells, saliva, and other biological material.

DNA analysis is a powerful tool because each person's DNA is unique (with the exception of identical twins). Therefore, DNA evidence collected from a crime scene can implicate or eliminate a suspect, similar to the use of fingerprints. It also can analyze unidentified remains through comparisons with DNA from relatives. Additionally, when evidence from one crime scene is compared with evidence from another using CODIS those crime scenes can be linked to the same perpetrator locally, statewide, and nationally.

DNA is also a powerful tool because when biological evidence from crime scenes is collected and stored properly, forensically valuable DNA can be found on evidence that may be decades old. Therefore, old cases that were previously thought unsolvable may contain valuable DNA evidence capable of identifying the perpetrator.

Similar to fingerprints

DNA is often compared with fingerprints in the way matches are determined. When using either DNA or fingerprints to identify a suspect, the evidence

collected from the crime scene is compared with a “known” standard. If identifying features are the same, the DNA or fingerprint can be determined to be a match. However, if identifying features of the DNA profile or fingerprint are different from the known standard, it can be determined that it did not come from that known individual.

DNA technology advancements

Recent advancements in DNA technology have improved law enforcement’s ability to use DNA to solve old cases. Original forensic applications of DNA analysis were developed using a technology called restriction fragment length polymorphism (RFLP). Although very old cases (more than 10 years) may not have had RFLP analysis done, this kind of DNA testing may have been attempted on more recent unsolved cases. However, because RFLP analysis required a relatively large quantity of DNA, testing may not have been successful. Similarly, biological evidence deemed insufficient in size for testing may not have been previously submitted for testing. Also, if a biological sample was degraded by environmental factors such as dirt or mold, RFLP analysis may have been unsuccessful at yielding a result. Newer technologies could now be successful in obtaining results.

Newer DNA analysis techniques enable laboratories to develop profiles from biological evidence invisible to the naked eye, such as skin cells left on ligatures or weapons. Unsolved cases should be evaluated by investigating both traditional and nontraditional sources of DNA. Valuable DNA evidence might be available that previously went undetected in the original investigation.

If biological evidence is available for testing or retesting in unsolved case investigations, it is important that law enforcement and the crime laboratory work together to review evidence.

LOGISTICAL ISSUES

The Long and Short of DNA

If biological evidence is available for testing or retesting in unsolved case investigations, it is important that law enforcement and the crime laboratory work together to review evidence.

Regarding access to and the cost of DNA analysis will be a factor, as well as issues that relate to the discriminating power of each technology and that might affect the outcome of the results. Laboratory personnel can also provide a valuable perspective on which evidence might yield valuable and probative DNA results. Finally, if previously tested biological evidence produced a DNA profile but excluded the original suspect, revisiting those “exclusion” cases in the context of comparing them with DNA databases might prove to be very valuable to solving old cases.

PCR analysis

PCR (polymerase chain reaction) enhances DNA analysis and has enabled laboratories to develop DNA profiles from extremely small samples of biological evidence. The PCR technique replicates exact copies of DNA contained in a biological evidence sample without affecting the original, much

like a copy machine. RFLP analysis requires a biological sample about the size of a quarter, but PCR can be used to reproduce millions of copies of the DNA contained in a few skin cells. Since PCR analysis requires only a minute quantity of DNA, it can enable the laboratory to analyze highly degraded evidence for DNA. On the other hand, because the sensitive PCR technique replicates any and all of the DNA contained in an evidence sample, greater attention to contamination issues is necessary when identifying, collecting, and preserving DNA evidence. These factors may be particularly important in the evaluation of unsolved cases in which evidence might have been improperly collected or stored.

STR analysis

Short tandem repeat (STR) technology is a forensic analysis that evaluates specific regions (loci) that are found on nuclear DNA. The variable (polymorphic) nature of the STR regions that are analyzed for forensic testing intensifies the discrimination between one DNA profile and another. For example, the likelihood that any two individuals (except identical twins) will have the same 13-loci DNA profile can be as high as 1 in 1 billion or greater. The Federal Bureau of Investigation (FBI) has chosen 13 specific STR loci to serve as the standard for CODIS. The purpose of establishing a core set of STR loci is to ensure that all forensic laboratories can establish uniform DNA databases and, more importantly, share valuable forensic information. If the forensic or convicted offender CODIS index is to be used in the investigative

stages of unsolved cases, DNA profiles must be generated by using STR technology and the specific 13 core STR loci selected by the FBI.

Mitochondrial DNA analysis

Mitochondrial DNA (mtDNA) analysis allows forensic laboratories to develop DNA profiles from evidence that may not be suitable for RFLP or STR analysis. While RFLP and PCR techniques analyze DNA extracted from the nucleus of a cell, mtDNA technology analyzes DNA found in a different part of the cell, the mitochondrion. Old remains and evidence lacking nucleated cells such as hair shafts, bones, and teeth that are unamenable to STR and RFLP testing may yield results if mtDNA analysis is performed. For this reason, mtDNA testing can be very valuable to the investigation of an unsolved case. For example, a cold case log may show that biological evidence in the form of blood, semen, and hair was collected in a particular case, but that all were improperly stored for a long period of time. Although PCR analysis sometimes enables the crime laboratory to generate a DNA profile from very degraded evidence, it is possible that the blood and semen would be so highly degraded that nuclear DNA analysis would not yield a DNA profile. However, the hair of the convicted offender or forensic index of CODIS is to be used in the investigative stages of an unsolved case, DNA profiles must be generated using STR analysis. The shaft could be subjected to mtDNA analysis and thus be the key to solving the case. Finally, it is important to note that all maternal relatives (for example, a person's mother or maternal grandmother) have identical mtDNA. This enables unidentified remains to be analyzed and

compared to the mtDNA profile of any maternal relative for the purpose of aiding missing persons or unidentified remains investigations. Although mtDNA analysis can be very valuable to the investigation of criminal cases, laboratory personnel should always be involved in the process.

CHROMOSOMES

Y-chromosome analysis

Several genetic markers have been identified on the Y chromosome that can be used in forensic applications. Y chromosome markers target only the male fraction of a biological sample. Therefore, this technique can be very valuable if the laboratory detects complex mixtures (multiple male contributors) within a biological evidence sample. Because the Y chromosome is transmitted directly from a father to all of his sons, it can also be used to trace family relationships among males. Advancements in Y-chromosome testing may eventually eliminate the need for laboratories to extract and separate semen and vaginal cells (for example, from a vaginal swab of a rape kit) prior to analysis. Cooperative efforts with the crime laboratory are essential to deciding which analysis methods will be most valuable in a particular case. It is important to note, however, that while RFLP and mtDNA testing may be valuable to the investigation of an old case, current DNA databases are being populated with DNA profiles that are generated using STR analysis. RFLP and mtDNA profiles are not compatible with the convicted offender or forensic indexes of CODIS.²

A broad range of considerations must be made long before any DNA testing is actually attempted in older, unsolved cases. These include:

- Legal considerations, such as the application or expiration of statutes of limitation
- Technological considerations, such as the nature and condition of the evidence as originally collected, stored, and in some instances, subjected to other forensic tests.
- Practical considerations, such as the availability of witnesses in the event DNA testing would identify a suspect and lead to an arrest and a trial.
- Resource issues, such as the time and money available for investigation and forensic analysis.

The nature and scope of these issues require that any approach to reexamining old cases for potential DNA evidence be collaborative, whether by an individual investigator or by a specialized unit developed specifically for cold case review. Local prosecutors can provide valuable insight into legal issues that might prevent or help a future prosecution. Victim/witness units or advocates can provide valuable assistance with locating, educating, and encouraging witnesses. Consultation with representatives from the crime laboratory is critical to ensuring that potential DNA evidence can be successfully analyzed.

EVIDENCE CONSIDERATIONS

When collecting unsolved case evidence from storage facilities, the case investigator should be ready to handle all types of packaging disasters. Evidence may be stored in heavy-duty plastic bags, stapled shut as the past

form of “sealing.” Multiple items may be sealed in one plastic bag, or even unpackaged in large, open, cardboard boxes. Unprotected microscope slides from medical facilities might also be found as a result of investigating old cases. No attempt should be made on the part of the investigator to separate and repack evidence. The condition and position that the evidence has been stored in could provide valuable clues to the forensic scientist for testability of evidence. Only when evidence is found unpackaged should the investigator properly package and label the item(s) to minimize the possibility for contamination from that point forward. It is important that any evidence items are handled minimally and only by individuals wearing disposable gloves. As always, it is also very important that all actions taken as a result of opening, evaluating, packaging, or repackaging evidence are documented thoroughly in the case folder.

Degraded evidence

Prior to the frequent use of DNA technology, biological evidence may have been collected and stored in ways that were not necessarily the best methods for preserving samples for future DNA testing. For example, evidence containing biological fluids that were originally collected for ABO Blood Typing analysis or other serology methods may have been packaged or stored in ways that can limit DNA testing. Some methods of collection and storage may promote the growth of bacteria and mold on the evidence. Bacteria can seriously damage or degrade DNA contained in biological material and inhibit the ability to develop a DNA profile; however, evidence can still sometimes

yield DNA results. For example, PCR technology can allow the laboratory to develop profiles.

Local prosecutors can provide valuable insight into legal issues. Victim/witness units or advocates can help locate, educate, and encourage witnesses. Consultation with representatives from the crime laboratory is critical.

Practical Considerations from some moldy biological samples, whereas other evidence may fail to yield a usable DNA profile, even when no mold is visible. Therefore, close consultation with the laboratory is important to determine the type of DNA testing most likely to yield results on the available evidence.

Contamination issues

Because of the particularly sensitive nature of DNA technology, the potential contamination of evidence should be carefully considered. Technologies used to analyze evidence prior to the forensic application of DNA were not always sensitive to contaminants. Evidence in older cases may have been collected in ways that lacked appropriate contamination or cross-contamination safeguards, which can make the DNA results less useful or even misleading. In these cases, clarifying results by identifying the contributor of an additional profile can determine whether the DNA results may now be used. When a mixture is detected, a careful reconstruction of the evidence collection, storage, and analysis process must be undertaken. It may be determined that DNA profiles will be required from on-scene officers, evidence technicians, or laboratory scientists who had access to the evidence for comparison with evidence results. In these instances, proper chain-of-custody reconstruction is critical.

It is also important to avoid contamination when handling biological evidence during the course of the current review. If evidence that may contain biological material is already sealed, do not reopen it before sending it to the laboratory.

(See Evidence Handling Recommendations.)

Legal considerations

Numerous legal issues might arise when examining older cases for potential DNA evidence. These issues are most likely jurisdictionally specific and may differ from State to State. Although most jurisdictions maintain no statute of limitation for filing charges in a homicide case, States can vary widely in the time allowed for filing charges in other cases, such as rape and other sexual assault crimes. Furthermore, in recognition of DNA technology's ability to solve old cases, many States are extending or even eliminating statutes of limitation for certain crimes.

Chain of custody

When a case remains unsolved for a long period of time, evidence is usually handled by an increased number of individuals. Many unsolved cases to be reviewed for DNA evidence may have been previously reinvestigated or handled by several different investigators as a result of new leads or periodic, systematic reviews. Furthermore, as cases age, the likelihood increases that evidence may be moved to new or remote storage locations as evidence from newer cases fills police department shelves.

Many cases may also have had evidence submitted to the laboratory for various forms of forensic testing. Evidence in older cases may have been submitted for

standard serological testing, but can now be tested for DNA with much greater success.

EVIDENCE HANDLING RECOMMENDATIONS

- Wear gloves Change them between handling each item of evidence.
- Use disposable instruments or clean instruments thoroughly before and after handling each evidence sample.
- Avoid touching the area where you believe DNA may exist.
- Avoid touching your face, nose, and mouth when examining and repackaging evidence.
- Put dry evidence into new paper bags or envelopes; do not use plastic bags.
- Do not use staples.
- If repackaging of evidence is necessary, consult with laboratory personnel.

As with all criminal investigations, chain-of-custody issues are critical to maintaining the integrity of the evidence. In all cases, the ultimate ability to use DNA evidence will depend on the ability to prove that the chain of custody was maintained.

Statutes of limitation

Statutes of limitation may be one of the most difficult issues to overcome when examining older cases. Statutes of limitation establish time limits under which criminal charges can be filed for a particular offense. These statutes are rooted in the protection of individuals from the use of evidence that becomes less reliable over time. For example, witnesses' memories fade as time goes by. However, although some evidence, such as eyewitness accounts, can lose

credibility over time, DNA evidence has the power to determine truth 10, 15, even 20 years.

The power of a DNA database system is evident not only in the success of solving crimes previously thought unsolvable, but through the prevention of crime after an offense is committed. States are beginning to realize that the reliability of DNA technology may necessitate the reevaluation of statutes of limitation in the filing of cases.

One of the first issues to address when reviewing an unsolved case is whether the statutes of limitation on a case have run out. Several considerations arise when addressing a statute of limitation issue. Good communication between law enforcement and local prosecutors is critical when examining these legal questions. In Uganda we possess the Limitations Act Cap 80.

Advances in DNA technology and the creation of DNA data-bases are leading many criminal justice professionals to rethink time limits placed on the filing of criminal charges. Because biological evidence can yield reliable DNA analysis results years after the commission of a crime, many State legislatures have begun to extend, and in some cases eliminate, the statutes of limitation for some crimes and in certain circumstances. Many States have extended the length of time for which a complaint can be filed, other States have eliminated statutes of limitation for certain crimes, and some legislation is retroactive.

Exceptions to statutes

Exceptions often exist under existing and new statutes. Under such exceptions, time can be added to the statute of limitation, giving police the legal authority

to arrest even if it appears as though the statute has run out. For example, many jurisdictions have exceptions for a suspect's flight from jurisdiction. In a case for which there is a 5-year statute of limitation, if the government can prove that the suspect has been absent from the jurisdiction for 2 years, the State can still file against the suspect for up to 7 years after the commission of the crime. Exceptions also exist for cases in which child victims are assaulted by a family member, which can be valuable in the context of a current investigation.

Statutes of limitation recommendations

- Know the original statute of limitation.
- Determine whether the law has changed regarding time limits for filing. If so, is the law retroactive?
- Determine whether there are exceptions to the statute.
- Consult with the prosecutor.

It should not be assumed that victims and witnesses are still interested in pursuing the case. Whenever possible, enlist the aid of victim service providers. Whether the process of reviewing unsolved cases is initiated by a single officer or by a specialized unit, it must ultimately be a team effort. At all stages of the process, investigators should avail themselves of the scientific advice of the laboratory and the legal expertise of the local prosecutor's office. Close consultation with the laboratory can ensure that evidence integrity is maintained and that limited laboratory resources are allocated effectively. Similarly, prosecutors can help identify issues that might occur at trial if a suspect is identified and arrested upon successful DNA testing. Good

communication between police, laboratories, and prosecutors can help identify and convict serious offenders and save valuable time and resources.

Victim and witness considerations

Another important consideration to be made early in the process is the willingness of victims and witnesses to proceed. Although many victims may continuously monitor the progress of their investigations, some choose to detach from the process over time. Reinvestigating a case may cause renewed psychological trauma to the victim and victim's family. It should not be assumed that victims and witnesses, even if they were eager to pursue the case when it occurred, are still interested in pursuing the case. A phone call from an investigator years later may not be a welcome event. Whenever possible, enlist the aid of victim service providers. If a new officer is handling the investigation, enlisting the assistance of the original investigator to make the first contact with the victim may also be helpful.

The older a case is, the more difficult it may be to locate witnesses. However, early identification of victim and witness availability may ultimately save significant resources. Consultation with prosecutors is mandatory when considering whether a witness would be necessary at trial.

IDENTIFY POTENTIAL CASES FOR REVIEW

An initial step in the DNA review of unsolved cases is to identify cases that might be amenable to DNA testing. While the cases considered for this kind of review will vary from jurisdiction to jurisdiction, it is important to define

minimum requirements that will likely benefit from this approach. Issues such as statutes of limitation and solvability factors should be thoroughly examined in cooperation with a prosecutor and the forensic laboratory to establish guidelines for case selection. It also will be important to identify the ultimate goals of the program so that the selection criteria can be tailored to meet those specific goals.

Cases that could benefit from a review for potential DNA evidence can be identified from numerous sources. In some instances, a single police officer or investigator may remember an unsolved case from years ago. In some departments a formalized cold-case unit may systematically review cases for the potential of DNA testing. Other cases may be identified by coordinated, interdepartmental efforts, victims or witnesses who have heard about the potential of DNA evidence, and laboratories taking inventory of their storage facilities. If a department is pursuing a systematic review of cases, either by one or two officers or by a formal unit, there are many sources that can be consulted for valuable investigative information, such as

- Autopsy, laboratory, prosecutor, and local agency logbooks
- Retired investigators
- Computer databases

Identify statutes of limitation issues

Statute of limitation issues might affect the ultimate ability to prosecute a case. Cases should be preliminarily reviewed by investigators in conjunction with the prosecutor's office to identify which prosecutions would be barred by the

statutes of limitation. If the goal of the unsolved case review program is to obtain convictions and statutes of limitation have expired on a particular case, a department may wish to save its resources for cases likely to yield convictions. However, if the goal of the program is to solve and close unsolved cases regardless of whether a conviction could be obtained, a jurisdiction may decide to review all cases that qualify under its guidelines. This is an important consideration in the context of investigating serial offenders whose criminal acts might span the course of years or decades.

Identifying, Analyzing, and Prioritizing Cases

Good communication between police, laboratories, and prosecutors can help identify and convict serious offenders and save valuable time and resources.

Define categories of cases solvability factors

Because the number of cases that qualify for reinvestigation might be very large, it may be beneficial for a jurisdiction to define cases according to several solvability factors. Solvability factors include facts and circumstances of a case that influence the likelihood that it might be solved through advancements in DNA technology. For example, a high probability exists that analysis of non suspect rape kits will yield valuable DNA results. Profiles generated as a result of DNA analysis can now be entered into CODIS, which can solve a case by matching to a convicted offender, or aid investigations by linking serial rapes to

each other. Additionally, if an unsolved murder case contains biological evidence foreign to the victim that did not produce viable results from ABO blood typing or RFLP DNA analysis, evidence could be reanalyzed with the more discriminating and powerful STR technology. It is also important to recognize and sort out cases that might not be as likely to be solved with DNA technology. An example might be an unsolved drive-by homicide because the perpetrator most likely would not have left biological evidence at this kind of crime scene.

Case review establish priorities

Once solvability factors and statute of limitation issues are addressed, it is important to continue the process by identifying the cases to be reviewed first. To preserve investigative resources when considering a larger number of unsolved cases for review, jurisdictions may prioritize according to the likelihood that cases will be solved or the likelihood that investigations will be aided. In establishing this priority, the following criteria can be considered:

- How many qualifying cases are there?
- Where are the case files located?
- Are case summaries available?
- How many cases will be assigned to an investigator?

To establish an investigative hierarchy, qualifying cases should be reviewed by experienced, proficient investigators. A checklist can be used throughout the review process so that managers can decide which cases will be worked first. A checklist can also provide review process consistency throughout the agency.

(See Sample Checklist at the end of this report.) The following categories may serve as a model for a hierarchy in prioritizing cases:

- There is a known suspect and physical evidence appears to have been preserved in a manner consistent with successful DNA testing and use of CODIS.
- There is no known suspect but physical evidence has been preserved in a manner consistent with successful DNA testing and use of CODIS.
- There is no known suspect and evidence was collected and preserved in a manner that may make it difficult to obtain a DNA profile.

Locating case files, obtaining evidence logs, and other documentation

Locating the case file and original evidence for the investigation may be a challenging endeavor. Changes in personnel, procedure, and facilities and the passage of time may complicate the process. When searching for a case file or evidence, an investigator may need to look in numerous places. Potential locations include, but are not limited to, the following:

- Police department property rooms (case files, evidence logs, whole evidence).
- Property warehouses (case files, evidence logs, whole evidence).
- Public crime laboratories (previously tested/submitted evidence, lab reports).
- Private laboratories (previously tested evidence, lab reports).
- Hospital/medical facilities (rape kits, medical reports, slides)
- Coroner/medical examiners' offices (autopsy reports)
- Courthouse property rooms
- Prosecutors' offices (previous trial or suspect investigation)

- Retired investigators' files (case notes and details not contained in file)
- Other investigating agency offices (investigative leads serial offender).

FORENSIC TESTING REPORTS AND PREVIOUSLY TESTED EVIDENCE

Because advancements in DNA technology enable laboratories to successfully analyze old evidence that might have been improperly stored or subjected to previous forensic analysis, it will be very valuable to locate any and all forensic reports that were produced as a result of previous analysis and/or testing. ABO blood typing, microscopic hair analysis, RFLP DNA analysis, or fingerprint analysis (among others) might have been performed in the course of the original investigation. The original case file should indicate whether and which types of forensic analysis were attempted. These reports also serve to memorialize proper chain of custody. Cooperation with the crime laboratory is crucial to locate and interpret existing forensic reports and to determine whether evidence would be amenable to reanalysis with new DNA techniques. Many combinations of options are available to investigators and laboratory personnel if biological evidence was available and previously tested. Exhibit 3 may serve to help investigators as they work with the laboratory to discuss options throughout the course of the investigation.

Locate biological evidence

When reviewing the case file for potential DNA evidence, it is important to know what kinds of evidence may yield a DNA profile. Given the power and sensitivity of newer DNA testing techniques, DNA can be collected from

virtually anywhere. Only a few cells can be sufficient to obtain useful DNA information to help solve a case. Exhibit 4 identifies some common items of evidence that may have been collected previously but not analyzed for the presence of DNA evidence. Remember, if a stain is not visible it does not mean that there are not enough cells for DNA typing. Further, DNA does more than just identify the source of the sample; it can place a known individual at a crime scene, in a home, or in a room where the suspect claimed not to have been. It can refute a claim of self-defense and put a weapon in the suspect's DNA can do more than identify a suspect. It can also

- Place a known individual at a crime scene.
- Refute a claim of self-defense.
- Put a weapon in a suspect's hand.
- Change a suspect's story from an alibi to one of consent.

On the other hand It can also provide irrefutable evidence that can change a suspect's story from an alibi to one of consent.

Evaluate for probative DNA evidence

On completion of reviewing the case file, reports, and evidence in consultation with the laboratory, it will be necessary to identify which evidentiary items will be amenable to DNA analysis. Consultation with the laboratory will be essential to determine the likelihood of obtaining results from DNA analysis, and consultation with a prosecutor is very important to determine which evidence will be probative to the case. Building the new investigation on cooperative efforts between the laboratory and prosecutor can save valuable

resources, develop leads, and identify previously overlooked evidence that may yield a DNA profile.

Continue investigative protocol

If DNA analysis is to be conducted, it may be important to obtain reference samples from prior suspects, and it might be necessary to be creative when obtaining these samples. While a biological sample in the form of blood or saliva can be obtained voluntarily through a consent form, a standard reference sample might already exist if previous forensic analysis.

Common items of evidence

Baseball bat Handle - Skin cells, sweat, blood, tissue,

Hat, bandanna, or mask - Inside Surfaces Sweat, hair, skin cells, dandruff, saliva,

Eyeglasses Nose or ear piece - Lens Sweat, skin cells

Facial tissue, cotton swab Surface - Mucus, blood, sweat, semen, ear wax

Dirty laundry Surface - Blood, sweat, semen, saliva

Toothpick Surface - Saliva

Used cigarette - Cigarette butt (filter area) Saliva

Used stamp/envelope seal - Moistened area Saliva

Tape or ligature Inside or outside surface - Skin cells, sweat, saliva

Bottle, can, or glass Mouthpiece - rim, outer surface Saliva, sweat, skin cells

Used condom Inside/outside surface - Semen, vaginal or rectal cells

Bed linens Surface - Sweat, hair, semen, saliva, blood

“Through and through” bullet Outside surface - Blood, tissue

Bite mark - Surface of skin Saliva

Fingernail/partial fingernail Scrapings - Blood, sweat, tissue, skin cells.

SOLVING COLD CASES WITH DNA: THE BOSTON STRANGLER CASE

This was a ghastly crime. Nineteen-year-old Mary Sullivan had just moved from Cape Cod to Boston, where she rented an apartment in the bustling Beacon Hill neighborhood. Within a few days of her arrival in January 1964, she was found dead. Her attacker raped her and strangled her to death.

Sullivan was one of 11 women whom Albert DeSalvo — known as the Boston Strangler — would later confess to killing. However, he then recanted, leaving lingering doubts about the possibility that the real assailant had eluded capture. DeSalvo was never convicted of any of the Strangler killings, but he was sentenced to life in prison on other rape charges. Fellow inmates stabbed him to death in 1973. For decades after his death, experts argued about whether he really was the Strangler or whether someone else committed the crimes and got away.

Evidence that finally linked DeSalvo to the Sullivan assault emerged in July 2013

DNA Provides Answers Over the years, NIJ has funded the examination of “cold cases” across the country through its Solving Cold Cases with DNA program. The funding helps police departments identify, review, investigate and analyze violent crime cold cases that could be solved through DNA analysis. Sometimes the cases are so old that DNA testing did not yet exist

when the crimes were committed, and testing biological evidence now might show a match with a suspect.

The PHILIP BULMAN NIJ funding helped the Boston Police Department solve a rape and murder case almost 50 years after the crime.¹⁵

In 2009 and 2012, the city of Boston received competitive grants under NIJ's cold case program. The Boston Police Department's cold case squad decided to use some of the NIJ funding to test DNA from a nephew of DeSalvo's and look for a match with seminal fluid that had been found on Sullivan's body and on a blanket at the crime scene. When forensics experts ran the test, they got a hit.

The match was possible because of tests that zero in on short tandem repeats (STRs), which are patterns found on DNA strands. Forensic scientists use a specialized test that focuses on male (Y) chromosomes. Y-chromosome DNA comes from fathers who pass their Y-STR DNA profiles to their male offspring. Barring a mutation, the profiles remain unchanged. Every male in a paternal lineage has the same Y-STR DNA profile. This includes fathers, sons, brothers, uncles, nephews and a wider group of male relatives, even out to third and fourth cousins.

NIJ has funded research on Y-STRs for years, believing that it would give forensics experts a powerful and important tool in certain cases (see sidebar, "NIJ's Research on the Y Chromosome").

¹⁵ National Institute of Justice | www.NIJ.gov 2 Solving Cold Cases With DNA: The Boston Strangler Case

Testing of Y-STRs in the Mary Sullivan case showed a match between DNA from the crime scene and DeSalvo's nephew. According to Boston officials, this match implicated DeSalvo and excluded 99.9 percent of the male population. But because a Y-STR profile is common to a group of male family members, it does not yield the more precise match to a particular individual available in other DNA tests.

Armed with the Y-STR testing results, Boston authorities went a step further and exhumed DeSalvo's body in July 2013 so they could conduct a confirmatory test using a DNA sample directly from DeSalvo. DNA extracted from a femur and three teeth yielded a match — specifically, DNA specialists calculated the odds that a white male other than DeSalvo contributed the crime scene evidence at one in 220 billion leaving no doubt that DeSalvo had raped and murdered Mary Sullivan.

NIJ's Solving Cold Cases with DNA Program Since 2005, NIJ has awarded more than \$73 million to more than 100 state and local law enforcement agencies through its Solving Cold Cases with DNA competitive grant program. This funding has allowed Y-chromosome DNA testing examines the male-specific portion of biological evidence. This can be especially important in cases in which a small amount of male DNA is recovered in the presence of a large amount of female DNA, such as in sexual assault evidence.

For more than a decade, NIJ has funded research and development projects on the Y chromosome. These projects include:

Validation of Y-STR multiplex kits, the development of a DNA typing system targeting the male-specific portion of the human genome and a database of Y-

chromosome markers in the U.S. population, the development and maintenance of the U.S. Y-STR Database, an evaluation of alternative strategies to improve the detection of male DNA. To read more about these and other NIJ-funded Y-STR projects, go to NIJ.gov, keyword: Y-chromosome the agencies to review more than 119,000 cases. The funding has also facilitated the entry of almost 4,000 DNA profiles into the FBI's Combined DNA Index System, yielding more than 1,400 hits.

The program has given agencies the opportunity to put resources toward solving homicides, sexual assaults and other violent offenses that otherwise might never have been reviewed or reinvestigated. Crime scene samples from these cases previously thought to be unsuitable for testing have yielded DNA profiles. And samples that previously generated inconclusive DNA results have been reanalyzed using modern technology and methods.

Thanks to these cold case funds and the latest Y-STR technology, the Boston Police Department was able to solve the mystery surrounding Mary Sullivan almost 50 years after her death. In Uganda such a funding ought to be realized to help solve mystery cases too.

DNA EVIDENCE IN THE O.J. SIMPSON TRIAL¹⁶

To draw appropriate lessons from the O.J. Simpson case, one must have an

¹⁶ William C. Thompson** University of California, Irvine ** Professor, Department of Criminology, Law & Society, University of California, Irvine, Calif. 92717; J.D., University of California, 1982; Ph.D., Stanford, 1984. The author was a member of O.J. Simpson's defense team.

accurate appreciation of the strengths and weaknesses of the DNA evidence against Simpson. Much of the public discourse about the case begins with the premise that the DNA evidence proved Simpson's guilt conclusively and proceeds quickly to an analysis of factors that might explain why the jury nevertheless voted to acquit. This line of analysis generally leads to unflattering conclusions about the fairness or intelligence of the Simpson jury and, more broadly, to cynical conclusions about the capacity of the criminal justice system, as currently constituted, to produce just results. The first section of this essay challenges the underlying premise of this analysis. I argue that the jury could quite reasonably have concluded that the DNA evidence against Simpson deserved little or no weight. When drawing conclusions from the Simpson case, it is also helpful to understand ways in which the DNA evidence in the Simpson case differed from the DNA evidence presented in other cases, and ways in which it was the same. The second section of this essay draws this comparison.

I argue that the extensive use of duplicate testing in the Simpson case greatly reduced concerns (that are crucial in most other cases) about the potential for false positives due to poor scientific practices of DNA laboratories. On the other hand, the Simpson case revealed serious problems regarding the collection and handling of biological samples, and the potential for cross-contamination of evidence, that are of general concern. Important issues also arose in the Simpson case concerning the manner in which DNA evidence should be presented to juries. The third section of this essay evaluates these issues, focusing on the use of statistics to help describe the strength of DNA

evidence for proving identity. I argue that the statistics presented in the Simpson case were misleading--they understated the probability of a false incrimination due to a coincidental match between DNA profiles and failed to take into account important variables that greatly affect the value of DNA evidence, such as the potential for error in the collection, handling or typing of samples. A close analysis of the DNA evidence in the Simpson case is useful, in part, because it shows the importance of these problems and provides insights into the strengths and limitations of proposals for addressing these problems, such as the use of likelihood ratios to characterize DNA evidence.¹⁷

THE DNA EVIDENCE AGAINST O.J SIMPSON

There has never been a case in which more DNA evidence was amassed against a single criminal defendant. Over 50 blood samples were tested. Many of the samples were split and tested in duplicate by two different laboratories. The key results are summarized here.

The Bundy Crime Scene

Although most of the blood at the crime scene matched victims Nicole Brown Simpson (NBS) and Ronald Goldman (RG), DNA profiles consistent with O.J. Simpson (OJS) were found in five blood drops on the Bundy walkway and in three blood stains from the rear gate. The Rockingham Glove --The right-hand glove found at Simpson's residence was saturated in blood. Although the great

¹⁷ Electronic copy available at: <http://ssrn.com/abstract=2214481>

majority of the blood matched the victims, three tiny samples taken from near the wrist notch produced profiles consistent with a mixture of DNA from OJS and one or both victims. However, the portion of the DNA mixture consistent with Simpson's DNA (but not the victims') consisted of a single genetic marker (allele) that is quite common. The Sock in Simpson's bedroom, police collected a pair of dark, finely-woven socks. One of these socks was later found to have a large bloodstain at the ankle that contained a DNA profile consistent with NBS. Three additional samples from the same sock (two from the leg area, one from the toe) contained minute amounts of material containing DNA consistent with OJS. The Bronco Blood samples were collected from Simpson's Bronco on two occasions: shortly after the crime on June 14th, and over two months later on August 26, 1994. Most of the samples were consistent only with OJS. But three small smears of blood collected from the console in August contained profiles consistent with a mixture of DNA from OJS, NBS and RG. According to prosecution experts, a sample collected from the console in June also showed a mixture of DNA from OJS and RG, although a defense expert testified that this result was inconclusive because a control had failed during the assay. A sample collected from the steering wheel in June had a profile consistent with a mixture of DNA from OJS and a second, unknown person.

It is important to analyze unstained materials next to the blood as a control for contamination. See NRC Report, p. 66. If this unstained material, known as a substrate control, is found to contain DNA, it invalidates the test because it raises the possibility that extraneous DNA (from a source other than the blood)

is also present. In the case of the Bronco console stain collected in June, a substrate control showed positive results of a type consistent with RG. In the opinion of a defense expert, this finding rendered all conclusions about the DNA type of the bloodstain scientifically invalid¹⁸. NBS might (or might not) have been included in this mixture as well. Finally, a sample from the carpet contained a profile consistent with NBS Rockingham Blood Drops.

The Story Model and DNA Evidence

Blood drops on Simpson's driveway, and in the foyer of his house, contained DNA consistent with his profile.

According to the story model, which is the leading theory of jury decision making, jurors evaluate a complex set of evidence by evaluating the plausibility of various stories (i.e., narrative accounts) of how the evidence might have arisen.

Consequently, in order to evaluate the performance of the Simpson jury, one must understand the various accounts of the DNA evidence that the jury had to assess. A major problem with public discourse about the Simpson case is that while the prosecution account of the DNA evidence is well understood, the defense account is not. Indeed, many commentators seem to have serious misconceptions about the defense account of the DNA evidence and have unfairly condemned the jury for accepting implausible "explanations" of the evidence that the defense never advanced.

¹⁸ See testimony of John Gerdes. Record at People v. Simpson, No. BA 097211 (Los Angeles Co., Cal. Super.Ct. August 2, 1995).

The plausibility of a story depends on its coherence and completeness (i.e., whether it accounts for all crucial facts), as well as its goodness of fit with the evidence. A key task for the jury in a criminal case is to decide whether any story consistent with the defendant's innocence is sufficiently plausible to raise reasonable doubts about the prosecution's account of the evidence.

The Prosecution Account

Let me try to set the record straight. The prosecution argued that Simpson cut his hand while murdering the victims and left a "trail of blood" from the Bundy crime scene, into his Bronco, and back to his residence at Rockingham. According to the prosecution account, the victim's blood was transferred to the Bronco because it was splattered on Simpson and saturated the glove (which Simpson carried with him until he dropped it behind his house).¹⁹ Hastie and Pennington have proposed that jurors construct the stories by developing their own narrative accounts of the evidence. In doing so they are undoubtedly influenced by the accounts suggested by the attorneys in their arguments, although they may construct novel stories that go beyond the accounts proposed by the attorneys. During the conference at which articles in this volume were initially presented, it became apparent to me that many participants were ignorant of the defense explanations for the blood evidence, or, worse yet, harbored serious misconceptions about them. For example, one speaker confidently derided those who accepted the defense theories as

¹⁹ Nicole Brown See, N. Pennington & R. Hastie, Evidence evaluation in complex decision making, 51 *J.Pers.& Soc.Psych.* 242 (1986); N. Pennington & R. Hastie, Explaining the Evidence: Tests of the Story Model for Juror Decision Making, 62 *J.Pers.&Soc.Psych.* (1992).

weirdoes and kooks comparable to those who believe that Elvis still lives, yet he had not taken the time to analyze or even understand the defense explanations for the DNA evidence. Another speaker based his conclusion that the verdict stemmed from racism in part on the observation that the defense explanation for the blood evidence was too preposterous for any reasonable person to accept. The “defense explanation,” as this speaker described it, was indeed preposterous, but bore little relationship to the explanation the defense actually advanced in the trial. Ignorant condemnations of the jury, and strawman arguments that ridicule Simpson’s defense by mischaracterizing it, have been standard fare in media commentary. In scholarly discourse our standards should be higher.

Simpson’s blood was pressed on the sock at the crime scene; perhaps Nicole’s bloody hand touched his ankle. Simpson disposed of the other clothing that he wore to the crime scene but left the socks in his bedroom because he did not realize they were stained with Nicole’s blood.

The Defense Account

The defense story had several elements. Simpson Bled at His Home and in the Bronco. The defense argued that Simpson accidentally cut himself at his home during the evening of the crime, perhaps while retrieving a cellular phone from the Bronco, and thereby left drops of his own blood inside the Bronco, on his driveway, and in the foyer of his home. Simpson later traveled to Chicago, where he cut himself again, and more seriously, when he broke a glass in his Chicago hotel room upon learning of the death of his ex-wife. The testimony

of Dr. Robert Huizinga established that there were two cuts on Simpson's left middle finger and that the smaller, less conspicuous cut could have bled sufficiently to account for the quantity of Simpson's blood found in the Bronco and at his Rockingham residence. The Bundy Blood Drops and Rockingham Glove Were Contaminated with Simpson's DNA at the LAPD Laboratory LAPD criminalist Colin Yamauchi admitted that he spilled some of Simpson's blood from a reference vial while working in the evidence processing room and that shortly thereafter, he handled the Rockingham glove and the cotton swatches containing the blood from the Bundy drop.

DNA of the person who left the blood drops (possibly the true perpetrator) could not be detected, the defense argued, because it was degraded and destroyed due to mishandling of the Bundy samples. LAPD criminalists collected the blood drops by swabbing them with wet cotton swatches. The swatches were then put in plastic bags and left several hours in a hot truck. The prosecution's experts all acknowledged that DNA degrades rapidly when blood samples are left in a moist, warm environment, that degradation can render the DNA originally in a sample untypeable, and that subsequent contamination of such a sample by a second person's DNA can cause it falsely to match the second person on a DNA test.

The defense proposed that some of Simpson's blood was inadvertently transferred to these evidentiary samples, perhaps on Yamauchi's gloves or instruments.

The defense argued that the pattern of the DNA test results fits neatly with the cross-contamination theory. The quantity of DNA found on the evidentiary

items was small enough to be consistent with such an inadvertent transfer. On the glove, the allele matching Simpson was found in samples from the wrist notch, in an area where²⁰ Considerable evidence was offered to support the theory that the large, prominent cut on the middle finger of Simpson's left hand occurred in Chicago. Several witnesses testified that they observed Simpson's hands during the trip to Chicago without seeing a cut. On the return flight, witnesses said the finger was bandaged and still oozing blood. Broken glass and blood stains were found in Simpson's Chicago hotel room.²¹

Yamauchi wrote his initials, and nowhere else. In the blood swatches, the quantity of DNA consistent with Simpson declined in the order in which Yamauchi handled them-- that is, the first sample he handled had the most DNA, the second, the next most, and so on. The last few samples he touched contained no typeable DNA. To further bolster the cross-contamination theory, the defense presented evidence of sloppiness in the LAPD's handling of samples prior to DNA testing. The criminalists were poorly trained with respect to sample handling, were not following a written protocol, did not understand the purpose and importance of precautionary measures, such as changing gloves, and made serious errors even when attempting to demonstrate proper sample collection and handling techniques. Defense expert Dr. John Gerdes, who reviewed DNA test results at the LAPD laboratory during the year

²⁰ This section is largely a summary of arguments offered by defense lawyer Barry Scheck in his closing statement. See Record at , September 28, 1995.

²¹ Record at 36978-85, July 14, 1995. 8 Record at 29827, 29833, May 30, 1995 ("Q by Mr. Scheck: did you get blood on your gloves when you opened Mr. Simpson's reference tube? A. (by Yamauchi): Yes. Soaked through the paper.").

prior to the Simpson case, found a history of serious contamination problems that he attributed largely to cross- contamination of DNA due to poor sample handling procedures. Dr. Gerdes also found startling evidence of cross-contamination in the DNA test results of the Simpson case itself: it appeared that the reference vials containing the blood of Nicole Brown Simpson and Ronald Goldman were contaminated with the DNA of O.J. Simpson! Extra alleles consistent with O.J. Simpson's appeared when the victim's blood was typed both at the LAPD laboratory, and at two other laboratories to which the same vials were later sent.⁹ The prosecution contended that cross-contamination of the Bundy drops was ruled out because substrate controls (i.e., test samples taken from unstained areas adjacent to the blood drops) were negative--that is, they contained no detectable DNA. If the Bundy drops were contaminated with Simpson's DNA, then the substrate controls should also have been contaminated. The defense had two responses to this argument. First, it appeared from the laboratory notes that the LAPD had failed to process and handle the substrate controls in parallel with the Bundy drops, leaving open the possibility that the substrate controls were not exposed when the cross-contamination occurred. Second, it is well established that substrate controls do not always pick up DNA contamination, even when they are handled in parallel with the contaminated samples.

The prosecution neither challenged nor rebutted this testimony.²² The defense theory was that the victim's vials were contaminated with Simpson's DNA

²² For a more detailed description of this evidence, see John C. Gerdes, *Criticism/Concerns Regarding DNA Forensic Testing Substantiated by Evidence Presented in the O.J. Simpson*

from Rockingham blood drops, which were processed in close proximity to the victim's blood vials in the LAPD evidence processing room. The prosecution offered no explanation for why Simpson's alleles would appear in the victim's samples. Dr. Robin Cotton of Cellmark suggested, after the trial, that the extra alleles might have been spurious experimental artifacts but she could not explain why these artifacts would happen to match Simpson's DNA profile across two genetic systems. Comments of Robin Cotton at the Sixth International Symposium on Human Identification, Scottsdale, Arizona, October 14, 1995. If the extra alleles are not really Simpson's DNA, then it seems a rather unlikely coincidence that they would happen to match Simpson's profile. Indeed, Dr. Gerdes¹⁰ No substrate controls were taken from the glove.²³ ("even in a [contaminated laboratory] blank controls do not necessarily become contaminated on every occasion"). The National Research Council, the research arm of the National Academy of Sciences, has issued two helpful reports on forensic DNA evidence. The first report focuses on a broad range of technical and statistical issues surrounding DNA testing. NRC I, Id The second report focuses primarily testified that his review of previous LAPD testing revealed numerous instances in which controls designed to detect contamination were negative even though contamination had clearly occurred. The prosecution neither challenged nor rebutted this testimony. Switching of Swatches.

Case. Proceedings of the Sixth International Symposium on Human Identification, forthcoming

²³ See, National Research Council, DNA Technology in Forensic Science (1992) (hereafter "NRC I"), p. 67

When defense experts examined the bindles containing the Bundy swatches, they made two startling discoveries: none of the bindles bore Mazzola's initials, after they were used to collect blood at the crime scene, the Bundy swatches were sealed in plastic bags and stored in a truck. At the end of the day, they were returned to the LAPD crime laboratory and left in test tubes overnight to dry. The next morning, criminalist Andrea Mazzola packaged the dried swatches in paper bindles. In a pretrial hearing about two months thereafter, Mazzola testified that she had placed her initials on each of the bindles.

The Bundy swatches should not have been wet when they were placed in the bindles, the defense argued. According to laboratory notes, the swatches had been allowed to air-dry in open test tubes for 14 hours before they were placed in the bindles. Dr. Lee testified that the swatches should have been completely dry within three hours. A study produced by the prosecution stated that swatches dry within 55 minutes but some what bore what renowned criminalist nad defense expert Dr. Henry Lee later characterized as wet transfer stains--the sort of stains that would be produced by contact with swatches that were wet with blood. These observations led Dr. Lee to a memorable conclusion: "something is wrong."

The defense suggested that one of the detectives took blood from Simpson's reference tube, created swatches, and then stored the swatches in plastic bags

until an opportunity arose to substitute them for the Bundy swatches (perhaps substituting the bindles as well).²⁴

NRC II updates and revises the recommendations of NRC I concerning procedures for estimating the statistical frequency of DNA profiles and presenting these results to a jury, but does not revisit the technical recommendations of NRC I with respect to issues such as the need for validation and experimental controls. On these technical issues, NRC I remains an important scientific authority.

The tell-tale wet transfers occurred because the detective failed to allow the swatches to dry adequately after removing them from the plastic bags. The defense was able to establish, through cross-examination of the prosecution's experts, that LAPD detectives are trained in the collection of blood samples; detectives have swatches and plastic bags for that purpose and often submit blood swatches to the respective departmental office.

Case in reference is one of Mazzola where At the trial, the defense pointed out that Mazzola's initials did not appear on what the prosecution claimed were the bindles, Mazzola testified that she must have been mistaken when she earlier testified that she had initialed the bindles. The prosecution argued that the swatches might nevertheless still have been wet because they might have been stuck together like sandwiches. According to the "swatch sandwich" theory,

²⁴ statistical characterization of forensic DNA evidence. National Research Council, *The Evaluation of Forensic DNA Evidence* (1996)(hereafter "NRC II"; all citations herein are to the April, 1996 prepublication release of NRC II, as the final published report had not yet been released when this article went to press)

which was never supported by evidence, the outer swatches would have dried, but the inner swatches might still have been wet. The LAPD criminalists kept no record of the number of swatches collected at the scene of the crime, nor the number placed in the bindles.

Moreover, the lead detectives in the Simpson case had access to the laboratory. Lead detective Philip Vannatter also had access to Simpson's blood. Blood was drawn from Simpson by Thano Peratis, a nurse, employed by the LAPD, the day after the crime. Peratis placed the tube of Simpson's blood in an unsealed envelope and gave it to detective Vannatter. The defense established that LAPD policy calls for evidence of this sort to be booked immediately, and that Vannatter could have booked it within minutes at either of two locations. But he did not do so. Instead, he kept Simpson's blood with him for at least several hours and, by his account, drove across the city with it to Simpson's residence, where he gave it to LAPD criminalist Dennis Fung.

Furthermore, blood was missing from Simpson's reference tube. Nurse Thano Peratis testified at a preliminary hearing that he had drawn eight milliliters (ml.) of blood from Simpson. Under close questioning, he expressed confidence that the amount was between 7.9 and 8.1 ml.

Whether Vannatter's account is accepted or not, the defense argued, it is clear that he had sole possession of Simpson's blood tube long enough to have removed blood and made some swatches had he chosen to do so.

However, records in the LAPD Crime Laboratory indicated that the tube had contained only 6.5 ml. when it was received by the laboratory. The prosecution

responded that Peratis must have been mistaken about how much blood was drawn. Nicole Brown Simpson's Blood Was Planted On the Sock²⁵

The blood matching Nicole Brown Simpson that was found on the sock was a large, thick stain, slightly larger than the size of a quarter. It had a slightly crusty appearance and made the underlying material of the sock stiff and puckered. Surely this stain would have been noticed, the Cross-contamination and planting are not inconsistent theories. Barry Scheck argued that inadvertent cross-contamination may have produced the initial incriminating results that convinced the police and criminalists of Simpson's guilt and may thereby have given someone the confidence to plant additional evidence in order to strengthen the prosecution's case and assure that a "guilty" man did not escape justice.

Whether the transfer actually took place at that point was a contested issue, Laboratory notes indicating the order in which items were received had initially shown the blood vial being received after a pair of Simpson's tennis shoes, which were know to have been received at the laboratory the next morning (because another detective, Lange, admitted that he took Simpson's shoes home with him for the evening). But the notes were altered to indicate that Simpson's blood vial had been received before the tennis shoes. Under cross-examination by Barry Scheck, Fung's account of how and when he received Simpson blood tube, and what he did with it, went through a series of changes as Scheck confronted Fung with news videotapes that appeared to contradict earlier versions. According to the final version, Fung received the envelope

²⁵ See testimony of Gregory Matheson, Record at 25031, May 1, 1995.

containing the tube from Vannatter in the foyer of Simpson's home and then placed it, with various other items, in a plastic garbage bag which was carried out to the criminalists' truck by criminalist Andrea Mazzola. Mazzola admitted during cross-examination that she was present when Fung said that Vannatter gave him Simpson's blood, but that she had not seen the transfer (she recalled during redirect examination, however, that she had closed her eyes for a moment's rest at precisely that time). She did not realize that the garbage bag she carried out to the truck contained a vial of Simpson's blood and did not see Simpson's tube until the next morning. Record at 30, July 7, 1994. Due to illness, Peratis did not testify at the trial, but the court allowed the defense to present a videotape of his preliminary hearing testimony. The court also allowed the prosecution to present a videotape made by one of the prosecutors in which Peratis is seen telling the prosecutor that his sworn testimony had been mistaken and he could now recall that he had drawn only 6.5 ml. of blood. The defense argued, had it been on the sock at the time the sock was collected. Yet on three separate occasions the sock was examined and the stain was not noticed. On June 13, 1994, criminalist Dennis Fung collected the socks in O.J. Simpson's bedroom. At that time, he was conducting a search for blood in Simpson's residence. He noted no blood on the socks. On June 22, 1994 the socks were examined at the LAPD laboratory by Michelle Kestler, a laboratory supervisor, and two experts for the defense, Michael Baden and Barbara Wolf. They noted no blood. On June 29, 1994, the socks were examined again as part of an inventory of evidence ordered by Judge Ito. The express purpose of the inventory was to determine what blood samples might be available to be split

with the defense. No blood was observed on the sock. The laboratory notes say “blood search, none obvious.” Then on August 4, 1994, the blood stain was discovered. This sequence of events makes it obvious that the blood was planted on the sock sometime after June 29, 1994, the defense argued.

Defense experts Dr. Henry Lee and Professor Herbert MacDonnell examined the sock and concluded that the blood stain had been pressed onto it while it was lying flat, and not while someone’s leg was in the sock. The blood had soaked through one side of the sock and left a “wet transfer” on the opposite inner wall at a point that would have been directly under the stain had the sock been lying flat. The wet transfer is inconsistent with the prosecution theory, the defense argued, because Simpson’s leg would have blocked such a transfer had he been wearing the sock when the blood was deposited on it during the murders. Based on Professor MacDonnell’s estimates of the drying rate of blood on the sock, the defense argued that by the time Simpson got home and removed the socks, the blood would have dried, making a wet transfer impossible at that point. The planting theory is also supported by evidence that the chemical preservative EDTA.

The prosecution responded that the dark brown bloodstain was simply missed because the black socks were viewed under less-than-ideal lighting conditions. A pivotal moment of the trial occurred during the testimony of prosecution expert Gary Sims, when Barry Scheck asked that the jury be allowed to examine the sock. In the author’s opinion, it was at that moment that the jury first came to believe that Simpson had been framed. Under the less-than-ideal lighting conditions of the courtroom, the jurors had no difficulty seeing the

blood on the sock was found in the stain, the defense argued. The victim's blood samples were stored at the LAPD laboratory in tubes that contained EDTA. When the defense first raised the theory that the blood on the sock had been planted, the prosecution sent the sock to the FBI laboratory and asked that the stain be tested for EDTA. Absence of EDTA would presumably have been taken as proof that the stain did not come from the laboratory tubes; but the tests performed by FBI agent-examiner Roger Martz did show evidence of the presence of EDTA. When the prosecution declined to call Martz as a witness, he was called by the defense. Martz admitted that the stain showed traces of EDTA but opined that the quantity was too low to be consistent with blood from a reference tube. The defense then presented Dr. Fredrick Reiders, who reviewed Martz test results and expressed the opinion that the quantities of EDTA present in the stain were indeed consistent with the stain originating in blood from a reference tube, and are too high to be consistent with blood from a living human being.

The defense argued that EDTA stands for ethylenediaminetetraacetic acid, a chemical that, in salt form, is used as an anti-coagulant and preservative of whole blood. EDTA functions as an anti-coagulant by chelating calcium, thereby rendering the calcium unavailable as a co-factor in the coagulation cascade. Dr. Reiders was a better qualified and more credible witness than Martz, who does not have an advanced degree, and that Reider's conclusion, if true, proves that the blood on the sock was planted. O.J. Simpson's Blood Was planted on the Back Gate. Most of the blood samples from the crime scene were collected

on June 13, 1994, the day after the murders. But the three blood stains on the rear gate were not collected until July 3, 1994. According to the prosecution account, these stains were simply missed during the initial collection and were only noticed later. According to the defense account, these stains were not collected the day after the crime because they were not there at that time. The defense offered a powerful piece of evidence to support the planting theory. A photograph taken the day after the crime shows no blood in the area of the rear gate where the largest and most prominent stain was later found. Barry Scheck introduced this photo during his cross examination of criminalist Dennis Fung. After displaying a photograph of the stains that Fung collected on July 3rd, Scheck then showed the photograph of the rear gate taken on June 13th. In one of the more memorable moments of the trial, Scheck pointed to the area where the largest stain should have been, and demanded “Where is it, Mr. Fung?”

The defense argued that the planting theory was consistent with the quantity and condition of the DNA in the samples from the rear gate. The other samples collected at the crime scene, including those from the front gate, were highly degraded and contained little typeable DNA. By contrast, the samples from the back gate contained high concentrations of undegraded DNA. The defense argued that these samples should have been somewhat degraded had they been exposed to the environment for three weeks before being collected.

Mr. Fung had no answer, nor was Scheck’s question ever answered by the prosecution. The planting theory was also supported by the FBI tests, which showed evidence of EDTA in the samples from the back gate. The Victims’ Blood in the Bronco the defense offered several explanations for the presence

of DNA consistent with the victims in the Bronco. One possibility, the defense argued, is that the victims' blood was planted in the Bronco by detective Mark Fuhrman in order to frame Simpson. Under this theory, Fuhrman swiped the Rockingham glove inside the Bronco in order to plant the victims' blood there. Although the detectives testified that the Bronco was locked when they first saw it and denied that anyone had opened the doors while it was at Simpson's residence, the defense pointed to evidence suggesting that Fuhrman had, in fact, opened the door of the Bronco. In his testimony, Fuhrman reported seeing blood stains on the lower sill of the Bronco's door. Photographs of the Bronco showed that there were indeed stains where Fuhrman reported them, but they could be seen only when the door of the Bronco was open. Even if Fuhrman did not swipe the glove in the Bronco, he might have transferred the victims' DNA there unintentionally, the defense argued. A photo taken at the crime scene showed Fuhrman standing in a pool of the victims' blood pointing at a glove. By this account, Simpson's DNA may have gotten on the glove because Fuhrman swiped it across the blood spots Simpson left there after cutting himself. In a possible Freudian slip, Fuhrman also testified about seeing blood in the Bronco; later correcting himself to say on the Bronco. It was after this photo was taken that Fuhrman went with the other detectives to Rockingham. If Fuhrman then entered the Bronco looking for evidence, the defense argued, the blood consistent with Nicole Simpson on the carpet could have come from Fuhrman's shoe.

A third explanation is that the victims' blood was planted in the Bronco while it was at a storage facility. On June 14, 1994, Dennis Fung first collected blood from the Bronco. The defense established that it was a general practice of criminalists, when swabbing blood, to collect the entire sample. Three witnesses testified that they had been in the Bronco after June 14th and saw no blood. On August 26, 1994, the Bronco was again inspected and blood was found on the console in the same location where Fung had collected the initial samples. In the interim, the Bronco was left at an unsecured storage facility where a large number of people had access to it and unauthorized persons were known to have entered it looking for souvenirs.

Fuhrman or another officer who had a bit of the victims' blood on a sleeve or shirt cuff could have accidentally swiped it onto the Bronco console while exploring for evidence. Finally, the defense argued that there could have been tampering with the Bronco swatches in the LAPD crime laboratory. If Nicole Brown Simpson's blood was planted on the sock, then her blood and that of Ronald Goldman could have been planted in the Bronco swatches as well.

DNA Evidence and the Jury

Although the defense account of the DNA evidence was not as simple or straightforward as the prosecution's, it was coherent and complete, and it had considerable factual support. It certainly cannot be rejected out of hand. Hence, arguments that begin with the premise that Simpson's guilt was obvious in light of the DNA evidence, and then proceed to an analysis of how the jury could have erred, warrant closer examination. Those who would argue that the jury erred need to say more than DNA-Q.E.D.²⁶ An examination of the competing theories also belies the claim that the DNA evidence was too

complex or arcane for the jury to understand. Whether the jury believed or disbelieved the tampering theory, for example, probably had relatively little to do with the jurors' understanding of scientific arcana and a great deal to do with the jurors' assessment of facts that they were uniquely well positioned to assess, such as whether the bloodstain on the sock is easy to see, and whether the prosecution adequately answered that famous question-- "Where is it, Mr. Fung?" There were a number of scientific issues in the case, but they had little to do with the fundamental science underlying DNA testing, or the details of laboratory procedures for typing DNA, and everything to do with the potential for cross-contamination of samples before they reached the DNA laboratories. Would it have been irrational or obviously wrong for the jurors to believe. The defense cited evidence that the grass at Rockingham was wet that morning. Blood from the crime scene that had dried on Fuhrman's shoe might have been re-wetted when Fuhrman walked on the grass at Rockingham, facilitating its transfer to the Bronco carpet. Those who wish to argue that the DNA evidence against Simpson was, in fact, quite powerful, should take the time to articulate specific reasons why the defense theories are untenable. Those who take this task seriously may find it harder than they imagine. That criminalist Yamauchi cross-contaminated the Bundy swatches and the glove with Simpson's spilled blood? Hardly is this theory difficult to understand? Not at all in this light has it seemed fatuous to claim, without further proof, that the jury was confused about the DNA evidence.

DNA Evidence and the Media

The news media did a poor job of explaining and evaluating the defense account of the DNA evidence. A number of crucial facts that supported the defense case received little or no coverage. For example, the presence of DNA

consistent with Simpson's in the reference tubes of the victims--a real bombshell--went virtually unmentioned in media accounts, as did the fact that criminalist Yamauchi spilled Simpson's blood immediately before handling the Rockingham glove and the Bundy swatches. Other important facts were mentioned without analysis or explication. Barry Scheck was shown on television asking "Where is it, Mr. Fung?" but the hoard of reporters that covered the trial provided almost no analysis of the meaning or import of the question, and seemed strangely uninterested in knowing the answer. Henry Lee was shown declaring that "something is wrong" but the media provided little information or analysis concerning what the problem was. Commentary on the defense theories of the evidence was often wildly inaccurate. It was frequently suggested, for example, that the defense account of the DNA evidence required a "massive conspiracy" in which dozens of people were involved in fabricating evidence.

Why was media coverage of the defense theories so inadequate and, indeed, misleading? Part of the problem may have been that the defense theories were articulated in full detail only in the closing arguments. But the basic contours of the defense (that the evidence was contaminated, compromised and corrupted) were set forth in the opening arguments. Competent reporters should not have needed Barry Scheck's closing argument to see the significance of Simpson's DNA in the victims' reference tubes. Competent commentators should not have needed Barry Scheck's help to understand that the defense needed no "massive conspiracy" to explain the evidence or that it

required a series of highly improbable laboratory errors or coincidental matches between DNA profiles. These suggestions are so wide of the mark as to be embarrassing.

The real problem with the news coverage may have arisen from the atmosphere in which the press covered the trial, which was collegial and yet intensely competitive. The reporters spent much of their time in “Camp OJ” comparing impressions and (in the author’s humble view) developed a massive case of group-think. Each reporter tested his or her impressions against an emerging consensus about what really happened. Well before the defense presented any evidence, the consensus had swung heavily and permanently toward guilt. Herd mentality led the reporters to view the trial through prosecutorial lenses.

How many conspirators are required by the defense theory of the DNA evidence?

In the author’s opinion, one or perhaps two would be sufficient. Readers who think otherwise should re-read the description of the defense theories offered herein, or should check the defense closing arguments and to trust and rely on the press briefings provided by the district.

This tendency was probably encouraged by talk shows like Rivera Live that offered an “inside view” of the case that was strongly biased toward the prosecution’s perspective. The attorney’s office while viewing the defense with skepticism. The competitive atmosphere probably exaggerated this bias.

Particularly when testimony covered unfamiliar issues, such as DNA evidence, reporters may have been afraid of making mistakes, of emphasizing the wrong thing, of failing to see the real truth. It probably seemed safer to accept the prosecutors' spin on the DNA evidence and to emphasize the facts that the prosecutors found important, than to highlight what the defense said. Consequently, damaging revelations about the DNA evidence that struck like bombshells in court made scarcely a ripple in the media coverage. Biased reporting and biased commentary probably reinforced each other. The commentators relied on the reporters when generating analyses of the trial evidence; the reporters relied on the commentary when deciding which facts were important and unimportant. In this atmosphere, it is not surprising that many commentators failed to understand the defense theories of the DNA evidence. Indeed, many commentators continue to mischaracterize the defense position even after hearing the closing arguments. The media commentary on the Simpson case thus provides a striking example of the power of preconceptions to distort people's evaluation of the facts. Public perceptions of the trial might well be different had the media done a better job of explaining the defense theories of the case.

THE DNA EVIDENCE IN OTHER CASES

The major difference between the DNA evidence against Simpson and the DNA evidence against most other criminal defendants, aside from its quantity, is that the Simpson prosecution arranged to have all important samples split and tested in duplicate by different laboratories, while the samples in other

cases are typically typed by a single laboratory without replication. The Simpson prosecution chose to test in duplicate in order to blunt anticipated attacks on the reliability of DNA test results, and this strategy was successful as far as it went. Although errors can occur in forensic DNA laboratories, and can cause both false identifications and false exclusions, the “massive conspiracy” claim, for example, is still very common.

It was implausible that two laboratories would reach the same false results incriminating Simpson through error. Consequently, Simpson’s defense team did not challenge the accuracy of any test results that were replicated by a second laboratory. The defense focused on the potential for error before the samples were split (i.e., during the collection and handling of samples by the LAPD criminalists). The Simpson case thus illustrates the benefits and the limitations of replication in DNA testing. Replication can greatly reduce concerns about error, but only for phases of the analysis that are actually replicated.

"Laboratory errors happen, even in the best laboratories and even when the analyst is certain that every precaution against error was taken." ("Bald statements or broad hints that DNA testing is infallible...are not only irresponsible, they border on scientific fraud").²⁶

²⁶ NRC Report, p. 88-89; Donald Berry, Comment, 9 Stat. Sci. 252, 253 (1994) ("Only the frequency and type of errors are at issue."); R.C. Lewontin, Comment: The Use of DNA Profiles in Forensic Contexts, 9 Stat. Sci. 259 (1994) (discussing sources of error); William C. Thompson, Comment, 9 Stat. Sci. 263, 265 (1994) (discussing data on laboratory error); Cf. Dan L. Burk, DNA Identification: Possibilities and Pitfalls Revisited, 31 *Jurimetrics* 53, 80

In cases where samples are typed only once, one must be concerned not only about the potential for error in the collection and handling of samples before DNA testing, but also about the potential for error during DNA testing. One-way errors can occur is through inadvertent switching, mixing or cross-contamination of samples during the testing process. Because samples in a given case are often processed together in a batch, it is possible for DNA from one sample accidentally be mixed with another sample, causing the same DNA profile to appear in both. Errors of this type have occurred in proficiency tests and have produced apparently compelling “DNA matches” between samples from different individuals. Accidentally switching two samples can also cause a false incrimination. In a recent rape case in San Diego, California, the laboratory accidentally switched the reference samples of the victim and defendant, and then mistakenly interpreted the presence of the victim’s own DNA in a vaginal sample as a “match” with the defendant’s DNA. The error only came to light during the trial, when a sharp-eyed defense expert found discrepancies in the laboratory’s internal chain of custody documents. Accidental sample switches have been documented in other cases as well.

A second way errors can occur is through misinterpretation of DNA test results. Although a comparison between two samples, using a forensic DNA test, usually produces either a clear-cut inclusion (match) or exclusion (non-match), or no result at all, these tests sometimes produce ambiguous results that are subject to alternative interpretations.²⁷

²⁷ See, W.C. Thompson & S. Ford, *The Meaning of a Match: Sources of Ambiguity in the Interpretation of DNA Prints*, In M. Farley & J. Harrington, *Forensic DNA Technology*, 93

A major problem with forensic DNA testing, at present, is that laboratories fail to use rigorous scientific procedures for resolving such ambiguities. Whether an ambiguous result is interpreted as a damning incrimination or a complete exculpation sometimes depends entirely on a subjective judgment by a forensic analyst. Because forensic analysts are not “blind” to the expected result in such cases, these judgments may be influenced by “examiner bias” (i.e., the tendency to resolve ambiguous stimuli in a manner consistent with expectations).³⁶ Courts have generally treated subjectivity in the interpretation of DNA tests as an issue going to the weight rather than the admissibility of DNA evidence, although the converse might be better public policy. If subjective interpretation is an issue going merely to weight, then questionable subjective calls are likely to be detected only in cases where the defense has the resources to hire an expert and gain access to the underlying laboratory work through discovery²⁸. Although this sometimes happens, the majority of criminal cases involving DNA evidence are resolved without any independent

(1991); W.C. Thompson, Subjective Interpretation, Laboratory Error and the Value of Forensic DNA Evidence: Three Case Studies, 96 *Genetica* 153 (1995) (hereafter, “Thompson, Subjective Interpretation”).

²⁸ 32 NRC Report at p. 88; Thompson & Ford, *supra* note 30, at 115 (showing photograph of falsely matching DNA prints); see also, J. Koehler, DNA Matches and Statistics: Important Questions, Surprising Answers, 76 *Judicature* 222, 229 (1993); J. Koehler, Error and Exaggeration in the Presentation of DNA Evidence at Trial, 34 *Jurimetrics J.* 21, 23-25 (1993); J. Koehler, A. Chia, & S. Lindsey, The Random Match Probability in DNA Evidence: Irrelevant and Prejudicial, 35 *Jurimetrics J.* 201, 206-10 (1995). 33 *People v. John Kocak* (Superior Court of San Diego County, California No. SDC 110465). The admission of error by the laboratory occurred during testimony of Cellmark employee Dr. Charlotte Word on Nov. 17, 1995. 34 NRC Report, at p. 88; Thompson & Ford, *supra* note 30, at 143. 35 NRC I, *supra* note 11, at p. 53-55; E. Lander, DNA Fingerprinting on Trial, 339 *Nature* 501 (1989); Thompson, Subjective Interpretation, Laboratory Error and the Value of Forensic DNA Evidence: Three Case Studies, *supra* note 30; Thompson & Ford, *supra* note 30.

check on the work of the forensic laboratory. On the other hand, if courts were to require, as a condition of admissibility, that laboratories employ interpretive procedures that are objective or blind, forensic laboratories will be compelled to adopt these more rigorous procedures in every case, thereby bringing the practices of forensic laboratories into compliance with the recommendations of the NRC and practices within the broader scientific community. A similar argument can be advanced for requiring laboratories, when possible, to test samples in duplicate.

PRESENTING DNA EVIDENCE TO THE JURY

There has been considerable debate about how best to characterize the value of DNA evidence when it is presented to a jury. The standard practice is to tell the jury which samples “match” and which do not, and to characterize the meaning of a match by presenting statistics on the frequency (in various reference populations) of the matching genetic characteristics.

The danger of examiner bias has led scientists in many fields to insist that procedures for interpretation of potentially ambiguous data be either blind or objective, and both NRC Reports have called for the use of blind or objective “scoring” procedures by forensic DNA laboratories (NRC I, *supra* note 11, at 72; NRC II, *supra* note 11, at 3-9), but forensic laboratories have not followed the NRC’s recommendations in this area. Faced with a choice between interpretive procedures that are scientifically rigorous, and procedures that maximize the analyst’s discretion to control the outcome of ambiguous cases, forensic laboratories often opt for discretion over rigor. If there is a scientific

justification for the continued use of subjective interpretive procedures in forensic DNA testing, in the face of contrary recommendations from the broader scientific community, it has yet to be articulated in the forensic science literature. In his article in this symposium, Prof. Imwinkelried offers a contrary point of view, arguing that courts should avoid making compliance with specific laboratory procedures a condition for admissibility of scientific evidence. Prof. Imwinkelried fears the creation of a judicially-mandated scientific orthodoxy that would hinder scientific progress. Although I find his argument persuasive in general, I do not believe it applies to a requirement that forensic laboratories eschew non-blind, subjective interpretation of potentially ambiguous data. The notion that it will hinder scientific progress to demand that forensic scientists use rigorous interpretive procedures is not one I find plausible. Indeed, I believe that progress in forensic science would be fostered rather than hindered by imposition of a judicial requirement that data be interpreted in an objective manner. The path to scientific progress requires scientific rigor; the subjectivity that currently infects much of forensic science as the antithesis of scientific rigor. Whether such a requirement could be imposed under existing law, or would require new legislation or appellate precedent, is a debatable issue.

The scientific validity of these frequency estimates has been subject to dispute, and that dispute is the primary reason that courts in some jurisdictions have excluded DNA evidence. The Simpson case illustrates this point nicely. For example, the fact that Simpson's DNA profile matches the profile of one of the Bundy drops with respect to characteristics found in only one person in millions, or billions, is useful to know, of course, but does not tell us the value

of the DNA match for proving that Simpson is the source of that drop because frequency statistics do not take into account the likelihood of a false match due to error or tampering.

Even if the frequency estimates are valid, however, they may still provide an inadequate index of the value of DNA evidence for proving that two samples have a common source. Frequency statistics speak to the probability that samples from different people might “match” by coincidence, but they do not reflect the likelihood that samples from different people might match due to error in the collection, handling, processing or typing of samples. To evaluate evidence of a DNA match, the trier-of-fact needs to know the overall probability of a false match (which includes the probability of an erroneous match), not just the probability of a coincidental match.

LIKELIHOOD RATIOS

Another way to characterize the value of DNA evidence is to use a likelihood ratio. In the Simpson case, a prosecution expert computed likelihood ratios for the DNA evidence. Although these statistics were not presented to the jury, they provide an interesting illustration of the strengths and potential problems of this form of evidence. To characterize the strength of the DNA match between Simpson’s DNA profile and that likelihood ratios provide a useful way for experts to communicate with one another about the strength of evidence because they can be formulated in a manner that takes into account any number of variables that affect the strength of the evidence. Whether likelihood ratios

are a good way to characterize the strength of forensic DNA evidence for a jury, however, is an open question.²⁹

A likelihood ratio is a number representing how much more likely a particular event would be under one set of circumstances than another. Likelihood ratios play a key role in what is known as the Bayesian approach to statistics (named after Rev. Thomas Bayes, a Scottish mathematician).³⁰ Although NRC II offers a tentative endorsement of the use of likelihood ratios in the courtroom, it calls for additional behavioral research to determine whether statistics presented in this form are interpreted appropriately by lay juries. *Id.* at 6-32. Of one of the Bundy drops, for example, prosecution expert Bruce Weir estimated the probability of the match, E, under two alternative hypotheses--H1: Simpson "had contact with the Bundy scene" and H2: Simpson "did not have contact with the Bundy scene." Weir assumed that the numerator of the likelihood ratio, $p(E/H1)$, was equal to one--in other words, that a "match" was certain if Simpson "had contact with the scene." He assumed that the denominator of the likelihood ratio, $p(E/H2)$, was equal to the population frequency of the matching profile--in other words, that the probability of a "match" if Simpson

²⁹ For reviews, See K. Roeder, DNA Fingerprinting: A Review of the Controversy, 9 *Statis.Sci* 222 (1994) and accompanying commentary by multiple authors; B. Weir, Population Genetics in the Forensic DNA Debate, 89 *Proc.Natl.Acad.Sci.* 11654 (1992); D. Kaye, DNA Evidence: Probability, Population Genetics, and the Courts, 7 *Harv.J.L&Tech.* 101 (1993);

³⁰ For a general discussion of the use of likelihood ratios to characterize courtroom evidence, see R. Lempert & S. Saltzburg, *A Modern Approach to Evidence* 148-53 (1st ed. 1977); John Kaplan, Decision Theory and the Factfinding Process, 20 *Stan.L.Rev.* 1065 (1969); Richard Lempert, Modeling Relevance, 75 *Mich.L.Rev.* 1021 (1977); David H. Kaye, What is Bayesianism? A Guide for the Perplexed, 28 *Jurimetrics J.* 161 (1988); David Schum & Anne Martin, Formal and Empirical Research on Cascaded Inference in Jurisprudence, 17 *Law & Soc'y Rev.* 105 (1982). The use of likelihood ratios to characterize the value of DNA is discussed at some length in NRC II.

did not have contact with the scene is equal to the probability of a coincidental match between Simpson's profile and that of another person. The frequency of the matching DNA profile was estimated to range from one in 800,000 to one in 2.6 billion. This likelihood ratio is misleading because it takes into account only one of several ways that the evidence could have arisen under the hypothesis that Simpson "did not have contact" with the Bundy crime scene. The prosecution proposed that the jury be told that the evidence was at least 800,000 times as likely to have arisen" if Simpson "had contact with the scene" than if he "did not have contact with the scene." It reflects the probability of a coincidental match.

A stronger case might be made for likelihood ratios if the alternative hypotheses were framed more carefully. For example, a likelihood ratio might compare the probability that Simpson would be found to match the DNA profile of the Bundy blood drop under the following two hypotheses--H1: that Simpson is the source of the DNA in the sample, and H2: that Simpson is not the source of the DNA in the sample. Simpson would still be "the source" if DNA from his blood vial were inadvertently or intentionally placed on the crime scene swatches in the LAPD Crime Laboratory. Hence, this formulation (unlike that in Dr. Weir's report) avoids the misleading implication that the DNA evidence rules out the possibility of cross-contamination or tampering.

But it still is between Simpson and another perpetrator, but does not take into account the possibility, advanced by the defense, that Simpson matched the DNA profile of the Bundy drops either due to inadvertent cross-contamination of samples in the crime laboratory or due to intentional planting of his DNA on swatches taken from the crime scene. If the probability of either of these

possibilities exceeds zero, it is simply inaccurate to say that the evidence “is at least 270 million times more likely to have arisen” if Simpson “had contact with the scene” than if he “did not have contact with the scene.” Indeed, a statistician can make no statement about the relative probability of the evidence if Simpson did or did not “have contact” with the crime scene without taking a position on the probability of a false match due to cross-contamination or tampering. But a statistician is in no position to evaluate these probabilities and, of course, has no business presenting his or her views on these issues to the jury. Hence, likelihood ratios of this type are not only inaccurate, they invade the province of the jury. They should not be admissible.³¹

It fails to take into account other sources of error, such as the possibility that the test results were misinterpreted by the laboratory analysts and thereby poses, albeit in a more limited way, the same problems. Another issue is whether likelihood ratios will confuse and mislead the jury. One danger is that the use of likelihood ratios will promote the prosecutor’s fallacy. To say that a DNA match is one million times more likely if defendant is the source of the evidence than if he is not, is not the same thing as saying that the defendant is one million times more likely to be the source if he matches than if he does not, but the average juror (and, indeed, the average lawyer) may be hard pressed to understand the difference. And a failure by the jurors to appreciate the difference could be tremendously prejudicial to the defendant. Although a

³¹ B.S. Weir, *People of the State of California v. Orenthal James Simpson: Statistical Interpretation of DNA Evidence*, June 21, 1995. Second Addendum. 42 *Id.*, at p. 40, Table 31 43 See, e.g., *People v. Cella* (1983) 139 Cal.App.3d 391, 405, 188 Cal.Rptr. 675, 684 (“If mathematical probabilities are to be of any use in the courtroom setting, all crucial variables must be quantified exactly.”)(emphasis in original).

careful expert can present DNA statistics in the form of a likelihood ratio without committing the prosecutor's fallacy, the line between correct and fallacious statements of the evidence is quite subtle when the statistics are presented in this format. Consequently, when likelihood ratios are used there is a danger that the expert will slip over the line into fallacious misstatement, and a danger that jurors will slip over the line into fallacious conclusions regardless of what the expert says.

DNA MATCHES INVOLVING MIXED SAMPLES

A number of the evidentiary samples that were typed in the Simpson case contained DNA of more than one individual. Although mixed samples are hardly novel in forensic science, the Simpson trial was the first case in which serious debate arose over the proper statistical characterization of DNA "matches" involving mixtures. To illustrate the issues, let us consider the bloodstain on the steering wheel of the Bronco. For each genetic system a given individual has no more than two alleles. The presence of three alleles in the steering wheel stain (on genetic systems HBGG and GC) therefore signals the first statement is a likelihood ratio, which an expert might properly present; the second is a direct statement about the defendant's probability of guilt, which an expert cannot properly present without invading the province of the jury.³² Psychologists have conducted a number of empirical studies on the

³² See William C. Thompson and Edward L. Schumann, *Interpretation of Statistical Evidence in Criminal Trials: The Prosecutor's Fallacy and the Defense Attorney's Fallacy*, 11 *Law and Human Behavior* 167 (1987)(hereinafter "Thompson & Schumann"); William C. Thompson, *Are Juries Competent to Evaluate Statistical Evidence*, 52 *Law & Contemporary Problems* 9 (1989); Jonathan J. Koehler, *DNA matches and statistics: Important questions, surprising*



conclusions people draw from statistical evidence. These studies have shown that people misuse statistical evidence under some circumstances and that this problem is exacerbated when the data are presented in certain formats. As yet, no studies have examined people’s reactions to likelihood ratios when evaluating DNA evidence. Each genetic system examines a different locus or area of DNA. At each locus, there are a limited number of alleles (genetic variants) that people might have presence of DNA from more than one person. NBS and OJS are said to be “included” in this mixture (which means that they are possible contributors) because all of their alleles are ones that are also observed in the mixture. Ronald Goldman is said to be “excluded” from this mixture (which means he is not a possible contributor) because he has an allele (allele 1.3 on the DQ-alpha system) that does not appear in the mixture. The mixture must contain the DNA of at least one unknown person, besides OJS and NBS, because the stain contains an allele (allele 4 on the DQ-alpha system) that is possessed by neither OJS nor NBS. What statistics does the jury need in order to evaluate the significance of this evidence?

Genetic System

DQ-Alpha Item LDLR GYPA HBGG D7S8 GC _____
 _____ Possible Alleles 1.1, 1.2, 1.3, 2, 3, 4 AB AB
 ABC AB ABC _____
 _____ OJS profile 1.1, 1.2 AB BB BC AB BC NBS profile 1.1, 1.1 AB AB AB

answers, 76 Judicature 222 (1993); Jonathan J. Koehler, Error and Exaggeration in the Presentation of DNA Evidence at Trial, 34 Jurimetrics J. 21 1993; D.J. Balding & P. Donnelly, The Prosecutor’s Fallacy and DNA Evidence, Criminal Law Review, 1994: 711-721 (1994); Regina v. Andrew Deen, Court of Appeals (Criminal Division), London, January 10, 1994.

AB AC RG profile 1.3, 4 AB AA AA BB AA _____
_____ Bronco Steering Wheel 1.1,[1.2],4 AB AB
ABC AB ABC

The prosecution initially proposed that the only statistics given to the jury be the frequency of each included person's profile (in various reference populations). The defense objected that these statistics are misleading because the rarity of NBS's profile greatly understates the probability of a coincidental "inclusion." Notice, for example, that the steering wheel stain contains every possible allele in five of the six genetic systems. Thus, for example, the jury would be told that NBS has a profile that is "included" in the stain on the steering wheel (which means that she could be a contributor) and that the frequency of her profile ranges from 1 in 2500 to 1 in 26,000 in various reference populations.

This means that everyone in the world would be "included" in the steering wheel stain on those five systems. On the sixth system, DQ-alpha, three of the six possible alleles might be present. Separate frequency estimates were generated from data bases of Caucasians, African-Americans, Southwestern Hispanics and Southeastern Hispanics. Hence, the probability that a randomly chosen person would be "included" in the steering wheel stain is quite high. In accordance with the genetic system LDLR, for example, there are two alleles, A and B, and everyone has one, or the other, or both of these alleles. No one can be excluded as a possible contributor to the steering wheel stain on system LDLR, because there is no allele in the system that is not present in the stain. The three alleles are called 1.1, 1.2 and 4. Allele 1.2 is shown in brackets



because its presence or absence cannot be determined with certainty in mixed samples. When allele 1.1 and 4 are present, allele 1.2 is said to be “masked.” See, Amplitype User Guide, Version 2, 4-6 - 4-7 (Cetus Corp., 1990) a recommendation by the National Research Counsel (NRC), the defense suggested that the appropriate frequency to assign to evidence of a match between an individual and a mixed sample is “the sum of the frequencies of all genotypes that are contained within (i.e., that are a subset of) the mixed pattern.” For example, in connection with the stain from the Bronco steering wheel, the defense suggested that the jury be given an approach as follows, to be told that OJS and NBS have DNA profiles that could be “included” in the stain on the steering wheel and that the percentage of people whose DNA profile could also be included is 45.4% among Caucasians, 59.2% among African-Americans, and 48.8% among Hispanics.

Percentage of Population Included in Stain (Bronco Steering Wheel) Matching

Caucasians	African-	Hispanics	Genotypes
Americans 1.1, 1.1	1.9 2.3 1.6 1.1, 1.2	6.1 7.9 4.7 1.1, 4	7.7 9.5 9.9 1.2, 1.2 6.0
8.6 4.1 1.2, 4	13.9 19.0 13.4 4, 4	9.8 11.9	SUM 15.1 45.4 % 59.2 % 48.8 %

Judge Ito was initially persuaded by the defense arguments and ordered the prosecution to present “NRC numbers” to the jury in connection with the mixture evidence. The prosecution responded with two counter-proposals. First, they offered to use likelihood ratios to characterize the mixtures. This proposal was withdrawn in the face of defense objections. The prosecution then offered a novel type of “frequency calculation.” For each mixed sample, Prof.

Weir computed the probability of drawing at random (from various reference populations) a set of individuals whose genotypes would collectively account for all alleles observed in each mixture. For the steering wheel stain, for example, Weir computed the probability that sets of two, three or four individuals, drawn at random from various racial groups, would collectively have all of the alleles.

The likelihood ratios were computed according to a method first proposed in Evett, C. Buffery, G. Willott & D. Stoney, as stipulated in *A Guide to Interpreting Single Locus DNA Profiles of DNA Mixtures in Forensic Cases*. (J. Forensic Sci. Soc. 41 (1991)). The computations are contained in an expert's report, B.S. Weir, *People of the State of California v. Orenthal James Simpson: Statistical Interpretation of DNA Evidence*, June 20, 1995. This approach was endorsed by NRC although the National Research Council notes that "[t]he problem is complex, and some forensic experts follow the practice of making several reasonable assumptions and then using the calculation that is most conservative." The defense offered to present expert psychological testimony, outside the jury's presence, to support the contention that a lay jury would tend to misinterpret likelihood ratios. The defense also contended that Prof. Weir had computed his likelihood ratios incorrectly.

It was observed in the mixture, and no others over defense objections, Judge Ito allowed Weir to present these statistics to the jury. To explain his approach to the jury, Dr. Weir analogized it to a slot machine on which one hits the "jackpot" only by getting a specific combination of fruit, such as a lemon, a

cherry and an orange. His approach, he told the jury, computes the probability of the specific combination of alleles observed in a mixture (the jackpot). To do otherwise, he said, would ignore the observed data. He claimed that his figures represent the only responsible, appropriate way to characterize the value of a “match” between DNA of a particular individual and a mixed sample. One problem with Dr. Weir’s approach is that it computes the probability only of a particular incriminating event (the observed data) but it does not take into account the full range of possible events that would be incriminating. It is unduly restrictive to compute the probability of seeing a lemon, a cherry and an orange when the “slot machine” need only have a lemon and a cherry to pay off for the prosecution. For example, the mixed stain on the Bronco steering wheel need not have had the 4 allele on the DQ-alpha system to incriminate Simpson. This mixture would have been equally incriminating had the “extra” 4 allele instead been a “1.3,” or a “2” or a “3” or had this “extra” allele not been present because this slot machine requires only a lemon.

For the steering wheel stain, Weir calculated that the chances that a randomly drawn set of individuals would have the observed alleles (and no others) ranged from 1 in 60 to 1 in 11,000 for two individuals; from 1 in 9 to 1 in 3500 for three individuals; and from 1 in 1 to 1 in 3000 for four individuals. B.S. Weir, *People of the State of California v. Orenthal James Simpson: Statistical Interpretation of DNA Evidence: Second Addendum*, June 23, 1995 (available from author). The numbers vary depending on the assumptions that are made about the population(s) from which the individuals are drawn. For example, the probability that two random African-Americans would have a particular combination of alleles may vary from the probability for a random African-

American and a random Caucasian, or Hispanic. The jury was ultimately told the range of these estimates (for sets of two, three and four random individuals) but was not given a separate estimate for each of the many possible combinations of ethnicities. For reasons that Dr. Weir has recently explained, the frequency calculations turned out to be worse for defendant Simpson than likelihood ratios would have been. For example, Weir computed the probability that four random contributors could account for the stain on the Bronco console to be between 1 in 240 million and 1 in 2.7 billion. However, he says that the likelihood ratio describing this evidence, under the assumption of four contributors, would be either 200,000 if one assumed OJS was not a contributor or 1000 if one assumes OJS was a contributor. Weir now contends that the likelihood ratios are the correct way to characterize the mixture evidence and professes to find it “ironic” that the defense objections to likelihood ratios led to the presentation of numbers that were even worse for the defendant. In fact, the defense objected to both types of numbers. Dr. Weir has offered no apology for presenting to the Simpson jury numbers that, by his account, “could have hurt the defense’s case” and were “a far cry from” the numbers that he now considers appropriate. Had Simpson been convicted, Judge Ito’s decision to allow Dr. Weir’s misleading statistical presentation would certainly have been an important issue on appeal. 56 Record at 33860, June 26, 1995. 57. With regard to the figures computed by the defense (e.g., those in Table 2), Dr. Weir was quite disparaging. He called these figures “deceitful,” saying “I wouldn’t even dignify [such a] number by putting it on the same paper” as his own figures. “I’m not saying it’s wrong, it just is wrong,” Weir told the jury. Record at 33780, June 26, 1995 cherry to pay off,

the probability of hitting a lemon, a cherry and an orange greatly understates the probability of a jackpot. Another problem with Dr. Weir's approach is that it requires the expert to make assumptions about matters outside his or her expertise, such as the number of people who contributed to the mixed stain and whether all alleles present in the sample were detected in the test.

Dr. Weir's presentation to the Simpson jury was also marred by an error that caused many of his frequency estimates to be biased against the defendant. One of the quirks of the DQ-alpha genetic system is that presence or absence of the 1.2 allele cannot reliably be determined in some mixed samples. In theory, this problem can be dealt with by having the expert compute the statistics under alternative assumptions. In practice, this requires a plethora of numbers to be computed and presented to the jury, which may be unworkable and confusing. The steering wheel sample, for instance, might or might not contain the 1.2 allele. When Weir initially computed the probability that two, three or four randomly chosen individuals would collectively have the alleles observed in the mixed sample, he assumed that the sample contained allele 1.2 and therefore failed to count possible combinations of random contributors who did not have allele 1.2. This error, which he acknowledged during cross-examination, 62 and corrected during re-direct examination, caused him to understate the actual probability he was trying to compute by a factor of 2-3. That even a distinguished statistician can make such an error is yet another lesson of the Simpson case.

Perhaps a gambling analogy would be instructive. Suppose that there is a roulette wheel on which every number appears as both red and black. Suppose further that I win a bet on this wheel after a spin yields the result "red 13."

What was the probability of my winning? One could compute the probability of hitting “red 13” by chance and take this number to have been the probability of my winning my bet. But this would be misleading if there were other ways I could have won. If I had bet generally on 13, or on red, for example, the probability of winning would be far higher than the probability of the particular results that made me a winner. The problem with Weir’s analysis, in my view, is similar. Weir computes the probability of obtaining, through a random draw, the precise results that proved incriminating while the appropriate figure is the probability of obtaining a result (any result) that is incriminating.

This number cannot be determined from the genetic evidence alone. Consider, for example, how many people might have contributed to a stain containing DQ-alpha alleles 1.1, 1.2 and 4. Obviously there is more than one, because each person has at most two alleles. But the possibility of two, three, four, five or even more contributors cannot be ruled out. Nor is it possible to determine, from the genetic evidence alone, the likelihood that the sample was left by two persons as opposed to, say, four persons. Experts will be strongly tempted to assume that all alleles of all contributors were detected because this assumption drastically narrows the range of possible contributors compared to the alternative assumption (i.e., that some alleles of some contributors were undetected), and thereby greatly decreases the frequency, making the DNA evidence appear more powerful. Yet an analyst obviously cannot know from the results of the test alone whether all alleles have been detected. And laboratories often declare matches in instances when some alleles of putative contributors fail to appear in the mixed sample (by attributing the “missing” alleles to allelic drop out or other artifacts). To assume for purposes of

statistical computation that all alleles have been detected, when that assumption is not necessary for purposes of matching, renders the resulting statistics “underinclusive” of possible matches, thereby improperly overstating the value of the DNA evidence.³³

C O N C L U S I O N

A major reason for O.J. Simpson’s acquittal was that the defense successfully neutralized the apparently overwhelming DNA evidence against him by offering plausible alternative explanations for all of it. The defense challenge to the DNA evidence was not an effort to confuse or obfuscate. It was well-grounded in science and was supported by considerable evidence. The failure of the prosecution to rebut several key elements of the defense attack inevitably left the jurors with reasonable doubts about the DNA evidence. Perhaps the most interesting aspect of the courtroom battle over DNA evidence is how poorly it was covered by the media and explained to the public. Public commentary on the case has, as a result, been shaped by gross misconceptions about the nature of the evidence and the defense explanations of it. Valuable lessons that might be learned from the trial about the limitations of DNA testing and about the need for care in the collection, preservation and handling of evidence have been lost in a blather of ignorant complaints about the stupidity or lawlessness of the jury. In fact, the jurors probably understood the DNA evidence far better than many of the commentators who have condemned them. Those who are willing to study the Simpson case closely can learn a great deal about DNA evidence. It is important to realize, however, that the

³³ See note, *supra*. 62 Record at 33522-28, June 23, 1995.

DNA evidence against Simpson was in many respects exemplary. The extensive use of duplicate testing resolved important concerns that arise in many other cases about the possibility of a false positive due to laboratory error, and the possibility of bias in the interpretation of test results. A close examination of the Simpson DNA evidence casts important new light on the continuing debate over how best to explain the value of DNA evidence to a lay jury. The likelihood ratios that were proffered by the prosecution, but withdrawn in the face of defense objections, illustrate some of the difficulties with this type of statistic. Although likelihood ratios have appealing features, the academic community has yet to fully analyze and discuss their usefulness for characterizing forensic DNA evidence. The problems with the likelihood ratios computed by Prof. Weir for the Simpson case are a cautionary tale. Until the strengths and limitations of likelihood ratios are better understood, courts should proceed with caution. It may well be safer to err on the side of caution by using statistics that may understate the value of DNA evidence than to risk using controversial new methods that may turn out to overstate its value, to the detriment of the defendant.

CHAPTER TEN



FORENSIC VICTIMOLOGY

Forensic victimology, a subdiscipline of forensic criminology, is the scientific study of victims for the purposes of addressing investigative and forensic issues. Forensic victimology is intended to serve the justice system by educating it. This area of study is aimed at helping to provide for informed investigations, to require scientific examinations of victim evidence to be presented in court, and to result in more informed legal outcomes. The purpose of this chapter is to provide a discussion regarding the nature and scope of forensic victimology, its investigative implications, and its impact on court proceedings. We will begin with a brief section outlining the more traditional forms of victimology because readers may have encountered them previously. Then we will discuss the purpose of forensic victimology, its investigative utility, and the forensic context. We will conclude with a discussion regarding who forensic victimologists are and what they actually do.

TRADITIONAL VICTIMOLOGY

Victimology is intended to be the scientific study of victims (Drapkin and Viano, 1974). Victimologists tend to find themselves operating within one of

three main subgroups: general victimology, penal/interactionist victimology, and critical victimology. General victimology is the study of all those individuals or groups who have suffered harm or loss, whether they are victims of a specific crime, general oppression, or a natural disaster. According to Mendelsohn (1976), this vast landscape includes victims of criminal offenders, the social-political environment, the natural environment, technology, and even those who victimize themselves. General victimologists are concerned with identifying or developing preventative measures as well as tools for victim assistance. They not only want to study the characteristics and causes of victimization, but also want to determine remedies. Interactionist victimology, or penal victimology, is the study of the dynamics between victims and their offenders. It is limited, however, to those who have been the victims of a specific crime. Interactionist victimologists study a victim's participation in crime causation through his or her interaction with the offender, the interaction between the victim and society, and the victim's subsequent role in the criminal justice system. Like the general victimologist, the interactionist intends to examine causes to develop remedies that favor the victim. Critical victimology has developed in reaction to the way that victimology is defined and studied by the first two subgroups. It seeks to question how criminality and victimity are established, tolerated, and even sanctioned. The basic premise is that any mainstream view of victims perpetuates existing yet inadequate definitions of crime and victimization. This may be observed in the overemphasis in research and policy on certain types of crime and crime victims, because they are clearly defined and easier to grasp. This in turn

results in a failure to study let alone recognize a host of both victim populations and their related social issues. It may also be observed in the way that a given justice system penalizes those who would elsewhere be viewed as victims, such as prostitutes who are selectively punished in some Western cultures, and victims of rape who may be punished in some Islamic cultures.

These victimology subgroups are alike in that they are ultimately oriented toward helping victims, in studying ways of “speeding up a victim’s emotional recovery, overcoming adversity, reimbursing financial damages, promoting reconciliation between the injured party and the wrongdoer, and restoring harmony to a strife-torn community” (Karmen, 2004, p. 24). In other words the professional compass in these subgroups’ points toward victim betterment. While this is an admirable goal and one well worth serving, it does not always promote an environment where scientific study is welcome. Contemporary victimologists can be found in many professions, including those associated with academia, the justice system, victim treatment, victim’s advocacy, and politics. They routinely have a mandate to help victims above all other considerations, or for political reasons they may need to be perceived as having such a mandate. However, satisfying this ideological imperative often requires uncritical and unconditional regard for those who present themselves, or are presented contextually, as victims. When this political or functional need clashes with the reality of victim imperfection, the results to any given professional can be chilling. The pendulum of bias can swing widely for and against. It is important to recall that victimology is meant to be a scientific study.

However, bias that develops for or against victims because of routine contact with them can act as a wall to the mandates of scientific inquiry, namely the requirements of doubt and skepticism.² This is a problem because some witnesses lie, some victims lie, and some people lie about being victims. Blind faith in a victim shields them from scientific inquiry; overt mistrust of victims shields others this is where forensic victimology comes in.

DISTINGUISHING FORENSIC VICTIMOLOGY

Forensic victimology is related to interactionist victimology, in which victims are defined by having suffered harm or loss due to a breach of law. This study involves the accurate, critical, and objective outlining of victim lifestyles and circumstances, the events leading up to their injury, and the precise nature of any harm or loss suffered. Forensic victimology does not seek to assist with victim advocacy or promote victim sympathy. Nor is the forensic victimologist invested in restoring victims and making them whole. However, there is awareness that the victim evidence gathered, as well as subsequent interpretations, may be used by others for these purposes at a later time.

In VestigatiVe utility as detailed in Turvey (2006), for more than a century the investigative and forensic science literature has acknowledged the importance of establishing the relationships between the primary components of a crime in order to solve it. These supporting pillars relate directly to evidence that establishes the relationships between the victim, the suspect, and the crime scene. This expansive body of work has given more than a small share of its pages to explaining the necessity of carefully investigating and documenting evidence as it relates to each, and determin- ing the connections that can be

reliably demonstrated. Establishing these pillars and the details of their relationships is in fact a threshold goal of all criminal investigation, so that criminal investigators and subsequent forensic examiners may adequately provide the foundation for any related court action. When these pillars are not investigated, examined, and firmly established, the theories of a case are essentially unsupported. They are at best a weak guess, and at worst, the erroneous result of biasing influences such as politics, emotion, ignorant beliefs, and personal interest. In this context, the application of forensic victimology is a necessary safeguard. As described in Dienstein (2005, p. 160) criminal investigation is the process of gathering facts to be used as evidence of proof in a court of law.

Without an investigation, the facts will be absent and proofs will be impossible to attain. Schultz (2005, p. 122) explains that prior to being tested in the courtroom, a competent investigation will gather or prepare evidence of the following: “knowledge or proof that a crime has been committed; the existence of a victim(s) ... an approved report of the investigation answering the questions of who, what, where, when, why and how; and evidence that has been identified and preserved for the prosecutor.” Only then may investigators proceed with their case to the district attorney for prosecutorial consideration. In the investigative realm, forensic victimology provides for the consistent recognition, collection, preservation, and documentation of victim evidence by investigators. Questions are asked, context is established, and history is documented. Each piece of victim evidence is scrutinized by investigators and then acted upon again and again until it is an exhausted possibility. This

informs the nature, scope, and depth of the investigation. It can also lead to the discovery of additional relevant or dispositive evidence. Ultimately, forensic victimology assists with answering the question of whether and how criminal charges may be levied and civil liabilities may have been incurred, all of which is going to be decided in court.

FORENSIC CONTEXT

It is understood that investigative and forensic venues are quite different in scope, structure, and function. The questions they need answered are particular to their unique geographical variations. They also represent very different standards of evidence. What may be investigatively useful speculation or theory at one point may lack the sufficiency for subsequent court-worthy opinions. Given the capacity for investigative work to find its way into court, this distinction must be ever-present and crystal clear.

GENERAL GUIDELINES

In the forensic realm (which continuously considers the courtroom), forensic victimology is a form of evidence that informs the nature, scope, and depth of any legal proceedings to be decided by the trier of fact (a judge or jury). When presented by a forensic expert, it involves the scientific interpretation of various kinds of victim evidence gathered during the investigation and any subsequent analysis. Ultimately, it assists with demonstrating the actual limits of victim evidence which criminal or civil theories it supports and which it refutes.

FORENSIC VICTIMOLOGISTS IN PRACTICE

Forensic victimology is an applied discipline as opposed to a theoretical one. Forensic victimologists seek to examine, consider, and interpret particular victim evidence found in a particular case, or series of cases, in a scientific fashion. Their numbers include anyone who uses their knowledge of victimology to serve investigative or forensic ends. The social scientist researching victim-offender relationships, the investigator going through a victim's garbage or cell phone records, the criminal profiler reading a victim's diary or making a "friends and family" list, the forensic nurse taking a victim history or looking for evidence of injury, the reconstructionist examining a victim's toxicology or making a timeline of activities leading up to his or her demise, the psychiatrist or psychologist performing a mental health assessment, the medical examiner establishing a victim's place of employment or last meal each collects, examines, and interprets evidence related to forensic victimology. Their work serves criminal investigation and anticipates courtroom testimony. Their findings and interpretations bear directly on determining whether there is a victim, precisely who the victim is, and the potential consequences for those who caused that person harm. Commonly, forensic victimologists serve investigations and eventual court proceedings with reports and testimony by endeavoring to:

1. Assist with contextualizing allegations of victimization;
2. Help support or refute allegations of victimization;

3. Help establish the nature of victim exposure to harm or loss;
4. Assist with the development of offender modus operandi and motive;
5. Help establish an investigative suspect pool;
6. Assist with the investigative linkage of unsolved cases.

General guidelines in terms of what is required for a thorough victimology, the national guide- lines for Death Investigation of the National Institute of Justice (NIJ), Section E: “Establishing and Recording Decedent Profile Information,” is a good place to start. However, we do not recommend that readers confine themselves to any single victimology checklist. Rather, examiners should treat nothing about a victim as trivial. Examiners therefore need to analyze each characteristic that presents itself until it is an exhausted possibility, to see how it relates to the rest of the vic- tim information. Weston and Wells (1974, p. 97) provide a quick checklist of preliminary victimological queries that have proven to be most useful in elic- iting investigative information. This is the kind of information that should be gathered immediately, ideally before the investigator arrives at a given crime scene:

1. Did the victim know the perpetrator?
2. Does the victim suspect any person? Why?
3. Has the victim a history of crime? A history of reporting crimes?
4. Did the victim have a weapon?
5. Has the victim an aggressive personality?
6. Has the victim been the subject of any field [police] reports? The following are some basic victimological inquiries that we have found useful when applied to actual casework. Gathering this information, along with the careful

examination of physical evidence, provides the starting point for investigative activity. This list is inclusive of items found in the National Institute of Justice (1999):

1. Determine the victim's hard physical characteristics (race, weight, height, hair color, eye color, etc.).
2. Determine the victim's occupation or place of work and shift schedule.
3. Compile the victim's criminal history.
4. Compile a list of the victim's daily routines, habits, and activities.
5. Compile a complete list of the victim's family members with contact information. Interview each of them.
6. Compile a complete list of the victim's friends with contact information. Interview each of them.
7. Compile a complete list of the victim's coworkers with contact information. Interview each of them.
8. Compile the victim's medical history.
9. Compile the victim's psychiatric history. Interview all of the victim's mental health care providers.
10. Compile a list of the victim's medications. Compare this with known victim toxicology.
11. Compile the victim's financial history (credit card usage, tax returns, insurance policies, etc.).
12. Compile the victim's educational history.
13. Compile a residence history of the victim (where he or she has lived, when, and with whom, etc.).

14. Spend time, when possible, with the victim's personal items, in the personal environments (hangouts, work, school, home/bedroom, etc.). Examine any available photo albums, diaries, or journals. Make note of music and literature preferences. Do this to find out who victims seemed to believe they were, what they wanted everyone to perceive, and how they seemed to feel about their life in general.

15. Compile all available information regarding the victim's mobile phone, computer, and Internet usage. When available, at least attempt to do the following:

- Determine the victim's service providers.
- Determine the victim's email addresses.
- Examine the victim's address books or contact databases.
- Examine the victim's incoming and outgoing email.
- Examine all documents on the victim's computer.
- Determine the last known usage of the victim's computer and various software applications.

16. Create a timeline of the victim's last known activities, factoring in all witness statements and physical evidence.

17. Travel the last known route taken by the victim in whatever manner the victim used. Try to see that route from the victim's perspective and then from the potential perspectives of the offender. Keep these perspectives separate.

18. Look for security video cameras along the victim's route, or potential route, that may have documented the victim's activities or even the actual crime.

Once this has been accomplished, the forensic victimologist can set to the task of determining victim lifestyle and situational exposure.

VICTIM LIFESTYLE EXPOSURE

Victim lifestyle exposure is concerned with studying the potentially harmful elements that exist in a victim's everyday life as a consequence of biological and environmental factors, as well as past choices. As defined in Petherick and Turvey (2008, p. 383), victim lifestyle exposure is "the amount of exposure to harmful elements experienced by the victim and resulting from the victim's usual environment and personal traits." This study requires an investigation and assessment of the victim's personality, and his or her personal, professional, and social environment (Turvey, 2008).

The causal link between a victim's lifestyle and his or her victimization is not always clear. The reason is that it is difficult to reconcile just how much influence any one lifestyle factor has on the criminal situation. Generally, lifestyle factors can influence harm to the victim in three ways: by creating a perceived conflict with an offender, by increasing the victim's presence around offenders or those predisposed toward criminality, or by enhancing an offender's perception of victim vulnerability. A victim's general lifestyle exposure to harm or loss should not be confused with situational exposure, which refers to harmful elements experienced by the victim resulting from his or her environment and personal traits at the time of victimization.

One analogy to differentiate these concepts is to consider lifestyle exposure as a "weather forecast,"

anticipating what harmful elements may be present by virtue of what has been present in the past under similar conditions and given various indicators; incident exposure can then be considered the “daily weather report,” identifying the actual cloud coverage, temperature, and precipitation on a given day. The interpretation of a particular victim’s lifestyle exposure is not just a function of compiling abstract group statistics for application to nonexistent victim stereotypes, though this is an unfortunate victimological tradition. Much more is required to achieve a concrete and actual understanding. To accurately determine a specific victim’s lifestyle exposure, one needs to assess the victim’s harm in the context of his or her specific lifestyle and personality traits. For investigative purposes, lifestyle factors must be questioned as to how, specifically, they contributed to harm. By utilizing the concept of victim risk, one may infer a conclusion based on statistical analyses of the potential to be harmed as being part of a demographic group. These conclusions ignore the specific characteristics of the victim and how they uniquely interacted with the offender given their situation. For example, statistics indicate that college students are at higher risk of victimization (Fisher et al., 1998). One might assume that the mere situation of being a college student increases exposure to harm. This assumption is not necessarily correct; not all college students are identical. Some expose themselves to more harm than others through their drug and alcohol use, routine, sexual activity, and a number of other factors. Making conclusions about the victim’s level of harm based on statistical analyses or probability estimates of risk do not accurately reflect how a specific victim’s lifestyle contributed to his or her harm, nor does it necessarily provide

investigative relevance. In contrast, the concept of victim exposure examines how a lifestyle factor specifically increased a victim's contact with harm.

Taking the example of Fisher et al. (1998) again, an investigator can discover that the victim was a college student and acknowledge that college students are at an increased exposure to harm; however, the specific interaction of this college student with her environment will dictate the actual level of potential for harm. One particular student who does not consume alcohol or drugs, lives at home with her parents, does not engage in high-risk sexual activity, and takes self-defense classes will represent a very different level of exposure than the student who does consume alcohol and drugs, lives in a bad part of town, engages in high-risk sexual practices, and does not take self-defense classes. Certain lifestyle traits such as interacting with potential offenders, drug use, and a high frequency of casual sex with strangers may also increase a victim's exposure to harm. Only by looking at the specific interactions of the variables can one sufficiently argue that a victim was exposed to harm. It should also be noted that, generally speaking, not all lifestyle factors can be said to have the potential to increase harm to a victim. It cannot be reasonably argued that the habit of collecting baseball cards played a significant role in the sexual assault of a male at a nightclub. Nor can it be easily argued that a victim's depression solely increased her exposure to gang-related homicide. Thus, for one to argue that a lifestyle factor influenced victim-offender dynamics, it needs to be both potentially harmful, in the sense that its presence could be argued to influence

opportunity for harm to occur, and also relevant, within the context of who the particular victim was and the criminal behavior that occurred.

Victim situational exposure

Victim situational exposure is the amount of actual exposure or vulnerability experienced by the victim to harm, resulting from his or her environment and personal traits, at the time of victimization (Petherick and Turvey, 2008). Consider the issue of alcohol. Being a person who routinely becomes intoxicated increases one's lifestyle exposure to the many harmful effects of alcohol, which will be mentioned shortly. However, unless a victim is actually intoxicated at the time of victimization, it does not necessarily raise her situational exposure. It is possible to have a high lifestyle exposure related to alcohol abuse, but a low situational exposure from lack of alcohol use or abuse at the time of victimization. The opposite is also true. Consider also the issue of firearms. Being a person who does not own a fire- arm, use a firearm, have one in one's home, or live with or interact with those that do decreases one's overall lifestyle exposure to the harmful effects of fire- arms. However, if a victim is at a shooting range for the first time with a new friend or romantic interest and is accidentally shot, it must be recognized that his incident exposure to harm from firearms was quite high at the time of victimization. This is true even if he was not participating or holding a gun, given his situational proximity to multiple loaded firearms being discharged by multiple persons of varying skill levels.

However, not all immediately harmful exposure is as transparent and easy to recognize from the victim's perspective as these basic examples might suggest. Harmful exposure may not even be apparent to investigators, owing to investigative apathy, or the reliance on false investigative assumptions about who and what were present during the crime. The situational harm coming from persons, environments, and circumstances relating to a particular crime must be thoroughly investigated, carefully established, and never assumed. The interpretation of a particular victim's situational exposure is not just a function of compiling crime stats, comparing them to the victim's presumed state of being when attacked, and making a general risk assessment. Much more is required to achieve a concrete and actual understanding. The nature, depth, and character of each victim's harm must be investigated, examined, and explained in its context. This means scrupulous examination of the information gathered regarding associated persons and locations. Barring this level of information and effort, the forensic victimologist must have the scientific courage to admit what is known and what is not. He or she must understand the scope and limits of the evidence. This is not too much to ask of any competent forensic examiner.

FORENSIC VICTIMOLOGY AT TRIAL

In cases in which victims' actions, history, or demeanor are relevant to legal proceedings, a victimologist may be asked to examine victim-oriented behavioral evidence and contextualize it before the trier of fact. This is the forensic aspect of forensic victimology. As has been discussed, the rules of admissibility vary from state to state, court to court, and judge to judge, as admissibility of

victimology evidence is made by the court on an individual basis and based on a sometimes-unique interpretation of the law. The question arises, then, as to the role of victimology and the victimologist in this venue. In general, forensic victimologists should conduct themselves as both scientists and educators. It is their role to provide a cooling effect to the often-heated issues surrounding victim-oriented behavioral evidence. They must examine the evidence impartially, through the lens of the scientific method, and render conclusions related to victimology in accordance with their findings. When necessary, they must be able to explain their findings to the court and show how they achieved them. For the small percentage of cases that do go to trial, there is an unavoidable vulnerability to the culmination of errors, improper motivations, and the zeal of advocates on either side of the courtroom.

This is particularly true of information related to the victim. As described in previous chapters, victimological information can be compiled ineptly, reported inaccurately, or provided in a biased manner and that is when it is collected at all. The misinformation that follows may combine during court proceedings to have a tremendous impact. Bad information can create a snowball effect: errors and omissions in the original information provided to the police can lead to errors in the investigation; these can lead to problems in the case assembled against the accused; which can lead to mistakes in the charges handed down and how the case is brought by the prosecution; leading to false perceptions by the judge, jury, and media. All these factors can have influence over whether or not a defendant is convicted and how he or she is sentenced. Generally speaking, one purpose of forensic victimology is to help prevent this snowball

effect from happening. Victimological information should be gathered objectively and consistently, and then used to describe or evaluate victims and their circumstances so that judges and juries are privy to information that may be relevant to their decisions. In this context, direct questions must be asked: Was the victim using drugs? Does the victim have a history of falsely reporting crime? What was the extent of the victim's physical injuries? Was the victim conscious during the attack? Does the victim have a history of taking rides from strangers or letting strangers into his or her home? Does the victim lock the door at night? The judge, who determines what is legally admissible, decides the issue of relevance for these and similarly themed questions. Then, as already discussed, the judge makes a ruling: sometimes everything about a victim is admissible, sometimes nothing, and sometimes the court "splits the baby" by admitting a percentage of victim information. The more accurate and complete the victim information provided, the clearer the context of the crime. This is an investigative axiom. During an investigation, everything about the victim must be learned and documented, with nothing treated as trivial.

Unfortunately, there is a tendency on the part of some investigators to avoid gathering some or all of the victimology, to deprive the court of contextual information that might sway the findings against prevailing case theories. The court should view this practice with dismay, as informed decisions about what to admit and what to keep out cannot be made in the absence of a complete investigative effort and record. As already discussed, presenting victimological information in court involves a different standard from the investigative effort. Investigative victimology gathers everything; the court decides admissibility

based on that record in the context of the collective issues in a case. Typically, victimological evidence must serve a particular purpose related to a legal issue to be admissible. For example, victimological information may demonstrate that a crime has actually occurred, or that the elements of this case meet the definition of the charges brought against the accused. Information about the victim will undoubtedly contextualize the crime and help to reconstruct exactly what took place and in what order. Information about the victim may also allow the judge and jury to better understand who the victim is or was, why he or she was targeted, how he or she was acquired and harmed, and most importantly by whom. On the other hand, if there is a specific reason to doubt the victim's credibility or the accuracy of particular statements, victimology may be introduced at trial to bring this to light. These are just some of the many possible scenarios, but the theme remains clear: to be admissible in court, victimology must be relevant to a factual matter or legal question, and not simply part of a smear campaign.

Case example: **Cannie Bullock** Joseph S. Cordova was accused of the sexual murder of 8-year-old **Cannie M. Bullock**, whose nude body was discovered in her backyard, covered with a blanket, on Saturday, August 25, 1979, during the early morning hours. Mr. Cordova was eventually identified as a suspect in her murder after a "cold hit" in 2002 matched his DNA to sperm found in the victim's vagina. In 2007, he was convicted of capital murder in relation to her death. Consider the timeline and victimology information provided in the following example, excerpted from the Crime Analysis report prepared in this case by one of the authors (Turvey) in preparation for subsequent expert

testimony on behalf of the defense. It is representative of the type of information that is considered when investigating and interpreting victim exposure (a.k.a. victim risk).

Background / timeline

The following background and timeline information is rendered from police reports, including the statements of Linda Bullock (29 y.o.) (the victim's mother), Debra Fisher (19 y.o.), and Mary Magdeline Sequeira (31 y.o.). It should be noted that during this period of time, Linda Bullock has admitted to frequently abusing both alcohol and methamphetamine. She also stated to police that she and Cannie (8 y.o.) had lived at 2628 ½ Dover Ave for approximately 3 months prior to Cannie's murder. She explained to police they moved there from Richmond where she had lived with her ex-boyfriend, Larry Buholzer, a member of a biker gang. They had recently broken up. While living with Buholzer, she admitted to frequently having different male visitors over to have sex and do drugs in her bedroom. Police directly asked her whether she had prostituted herself or her daughter Cannie for drugs or money, though Linda Bullock denied doing either (this issue is revisited in the victimology section of the report).

1. 8/24/79 just prior to 2300hrs – According to Debra Fisher, Cannie Bullock got in the shower and then Linda Bullock, who also wanted to take a shower, kicked her out. Cannie got out and dressed in her white bathrobe. According to Debra Fisher, who lived with Linda and Cannie at the time, it is unlikely that Cannie was wearing anything beneath the bathrobe.

2. 8/24/79, between 2300 and 2330hrs – Linda Bullock and Debra Fisher left the Bullock residence, 2628 ½ Dover Ave, San Pablo, for Oscar’s Bar in Richmond, to play pool. Cannie was left home alone with instructions not to open the door for strangers. Linda Bullock claimed to have the only key to the residence, and locked Cannie inside as she left. She also made certain to latch the front gate on her way out. Starting out on foot, Linda and Debra ultimately hitched a ride to Oscar’s with a man they knew named Bobby. It should be noted that the precise nature of the relationship between Bullock and Fisher (friends, lovers, etc....) has not been made clear. This issue should be investigated further.

3. 8/25/79, 0200hrs – Debra Fisher and Mary Magdeline Sequeira (a bartender at Oscars, aka “Bobby”) left Oscars Bar for Cleo’s Corner to play pool. Linda Bullock stayed at Oscar’s Bar to play pool with a man named Dennis (also a bartender at Oscar’s).

4. Between 2330 and 0300 – While at Oscar’s Bar, Linda Bullock got into a fight with “Pam” over a previous altercation that had occurred at a house party at Bullock’s residence. That evening, Linda Bullock threw a drink in Pam’s face, while Pam threw a cigarette in Linda Bullock’s face.

5. 8/25/79, between 0245 and 0300hrs – Linda Bullock got a ride home with Dennis the bartender. She explained to police that she was afraid of retaliation by Pam, and Dennis was escorting her. Dennis entered the house with her. Linda found the front gate unlatched, the front door ajar, the porch lights off and non-functioning, and Cannie missing. She searched the residence and found the sofa bed where Cannie sleeps in disarray, and Cannie’s bathrobe at

the foot of the sofa bed with red stains on it. She subsequently asked Dennis to leave.

6. 8/25/79, 0245hrs to 0330hrs – Linda Bullock searched for Cannie, during which she found the gate ajar in the backyard. However, she did not report seeing the blanket or finding the body in the backyard.

7. 8/25/79, 0300hrs – Debra Fisher and Mary Magdeline Sequeira left Cleo’s Corner for Linda Bullock’s residence, where Fisher planned to spend the night. They found Linda Bullock yelling for Cannie and further assisted with the search. Mary Sequeira observed torn bedding on the sofa, and Cannie’s bathrobe stuffed between the mattress and the sofa bed. They still do not report seeing the blanket or finding the body in the backyard.

8. Note: CSI Bentley found the victim’s robe on the floor near the doorway to the kitchen area where he understands Linda Bullock dropped it. He takes time in his report to explain that persons entering the residence would likely have stepped on the robe. This issue is revisited in the investigative suggestions section of this report.

9. 8/25/79, after 0300hrs – Linda Bullock reportedly contacted her landlady, Rose Azevedo, at 2628 Dover (the house in front of hers). In the past, Azevedo has taken Cannie into her home when her mother has been out late. There is some hostility between them. On this occasion, Azevedo reportedly refused to let Linda Bullock into her home to search for Cannie, or to use the phone to call authorities. Linda Bullock does not have a phone.

10. 8/25/79, prior to 0330hrs – Cannie Bullock is reported missing to San Pablo Police Department by Debra Fisher, who uses Linda Bullock’s name. Debra

Fisher reportedly got Azevedo to agree to let her use the phone. At this point, no one has reported seeing the blanket or finding the body in the backyard.

11. 8/25/79, prior to 0330hrs – Lt. Burke and Officer Vaughan searched the interior and exterior of Bullock’s residence at 2628 ½ Dover, finding Cannie’s body in the backyard.

12. 8/25/79, approx. 0451hrs – Police inform Linda Bullock that her daughter Cannie is dead. She subsequently becomes hysterical, sits on the floor, starts crying, and then passes out. Police are unable to get any further information from her at this point.

13. 8/27/79, approx. 1400hrs – During a police-initiated interview at her home in Pinole, Debra Fisher presents Det. Bennet with a Sear’s sewing machine catalog and a small charm resembling the zodiac sign of Sagittarius (the Archer). Fisher explained that she and Linda Bullock had found these items on the coffee table of Bullock’s living room. She explained that they did not know where they came from, and that neither owned a sewing machine.

VICTIM O L O G Y

Victimology is the study of available victim information for the purposes of assessing their risk of becoming the victim of a particular type of crime. There are two kinds of victim risk to assess: lifestyle risk and incident risk. Lifestyle risk is a term that refers to the overall risk present by virtue of an individual’s personality, and their personal, professional, and social environments. Incident risk is a more specific term that refers to the risk present at the moment an offender initially acquires a victim, by virtue of the victim’s state of mind, and

the hazards of the immediate environment (Burgess & Hazelwood, 1995; Turvey, 2002).

Each type of victim risk may be generally characterized in one of three ways: low, medium, or high. The term low-risk victim refers to an individual whose personal, professional, and social lives do not normally expose them to a possibility of suffering harm or loss. The term medium-risk victim refers to an individual whose personal, professional, and social lives can expose them to a possibility of suffering harm or loss. The term high-risk victim refers to an individual whose personal, professional, and social lives continuously expose them to the danger of suffering harm or loss (Burgess & Hazelwood, 1995; Turvey, 2002).

In this case, we have a victim (Cannie Bullock) with a high lifestyle risk, and a high incident risk. Cannie Bullock would be classified as having a high lifestyle risk because of at least the following lifestyle influences:

1. Cannie Bullock was an 8-year-old child that spent much of her time without monitoring or parental supervision.
2. Cannie Bullock and her mother lived in a home in a secluded area behind their landlady's house where it is extremely difficult to observe activity from the street.
3. Cannie Bullock's only true caregiver (her mother, Linda Bullock) abused both alcohol and methamphetamine prior to and up until the time of her death.
4. Cannie Bullock was left without care or supervision until the early hours of the morning on a regular basis.

5. Cannie Bullock's mother was known to have an angry temper.
6. Cannie Bullock's mother was known to frequently have different male visitors in their home to have sex and consume drugs.
7. Cannie Bullock's mother had just recently ended a long-term relationship with a male in a biker gang.

Forensic Victimology

Note: It is unknown whether or not Cannie Bullock suffered from chronic physical or sexual abuse prior to her death. These issues were not addressed sufficiently at autopsy. It is strongly recommended that an investigation be conducted into whether or not Child Protective Services, or some similar child welfare organization, had a file on Cannie Bullock, or this home. In cases such as this, it is common for investigators to fail with respect to investigating or establishing these circumstances, for fear of alienating a parent as a witness.

Cannie Bullock would be classified as having a high incident risk because of at least the following circumstances present on the evening of her death:

1. Cannie Bullock's home is a nexus for high-risk activity (drug abuse, alcohol abuse, partying, sexual activity with an increasing number of different men, etc...). Simply being at that specific location increased her risk of harm.
2. Cannie Bullock had been left at home alone.
3. Cannie Bullock was an 8-year-old child; she would be less able to physically defend herself from any form of danger that presented itself that evening.
4. Cannie Bullock had been left at home after 11pm on a Friday night. Because of the time of day, the darkness, and the fact that it was the beginning of the

weekend in conjunction with the activities regularly associated with the home, Cannie was essentially left alone to confront anyone who came looking for any of the above mentioned high risk activities.

5. Cannie Bullock's mother had gone to the bar that night to drink, leaving Cannie at home alone. 6. Cannie Bullock's mother had gotten into a fight that night before coming home.

It should be noted that the police specifically asked Linda Bullock whether she had prostituted herself or her daughter Cannie for drugs or money. This means they had specific reasons to suspect that this activity was going on, as these are not questions to be asked lightly. Indications of both exist in the material provided to this examiner, though there is no definitive evidence. If either circumstance were the case, the very highest level of lifestyle and incident risks would be in play.

Given the lifestyle and incident risk in this case, this examiner concludes that the number of potential suspects for the homicide in this case is quite high. At the same time, this victimology also strongly suggests that Cannie Bullock would not have opened the door for a complete stranger. Victimology refers to the scientific study of victimization, including the relationships between victims and offenders, investigators, courts, corrections, media, and social movements (Karmen, 2004). Forensic victimology is the idiographic and nomothetic study of violent crime victims for the purposes of addressing investigative and forensic issues (Petherick and Turvey, 2008). This type of victimology differs from traditional forms of penal victimology, in that it is the

objective study of victims with a focus on impartially and completely describing all aspects of their life and lifestyle in order to gain a better understanding of how they came to become victimized and their relationship to the offender and the crime scene. The goal of the forensic victimologist is not one of advocacy or rehabilitation; it is accurately, critically, and objectively describing the victim to better understand victims, crime, and criminals to assist the court. Forensic victimology seeks to study victims as they are in a critical and scientific manner, disregarding stereotypical views to better understand the dynamics of the criminal act as well as the victims themselves. In terms of what is necessary to compile a victimology, the answer is dependent on the case as well as the victim. No one checklist will encompass everything that should be examined about a victim. Nothing should be treated as trivial. This information can then be used for a number of purposes, including supporting or refuting allegations of victimization, establishing a suspect pool, and so on. Importantly, victimologists need to make note of any factors which influence the victim's lifestyle and situational exposure. Determining these levels of exposure will assist with the development of the offender's modus operandi and signature, assist with linkage of unsolved cases, narrow suspect pools, and assist with contextualizing the case. When it comes to a trial setting, victimologists may help the court determine that a crime has occurred; help the court determine that elements of the case meet the definition of the charges brought against the accused; reconstruct and contextualize what occurred; and demonstrate who the victim is/was, why he or she was targeted, how he or she was acquired.

CHAPTER ELEVEN



WRITING FORENSIC REPORTS

The majority of forensic examination reports do not meet acceptable scientific standards. In fact, it is common for such reports to “contain only identifying and agency information, a brief description of the evidence being submitted, a brief description of the types of analysis requested, and a short statement of the results,” and “[t]he norm is to have no description of the methods or procedures used, and most reports do not discuss measurement uncertainties or confidence limits” (Edwards and Gotsonis, 2009, p. 6–3). In other words, most forensic examination reports do not explain how results were achieved or interpretations were rendered, and tend to leave readers with a false sense of overconfidence regarding the findings presented. The authors have seen autopsy reports in complex homicide cases that average 3 pages long from one forensic pathologist and 30 pages from another. We have seen DNA reports from criminalists that are a half page long in one jurisdiction and three to four pages for similar evidence tested in another.

As explained by Dr. John Thornton (Kirk and Thornton, 1970, pp. v–vi): “When the liberty of an individual may depend in part on physical evidence, it is not unreasonable to ask that the expert witnesses who are called upon to

testify, either against the defendant or in his behalf, know what they are doing.” The purpose of this chapter is to help alleviate the epidemic of substandard reporting that currently plagues the forensic community. While forensic criminology must be featured, it is universal in its application to any endeavor where scientific results are being rendered for court-related purposes. It provides a practical foundation regarding the necessary philosophy of forensic reporting and basic outline for how such reports should be prepared.

Forensic practitioners require a predisposition for objectivity, competence, and professionalism in their work (Thornton, 1997). Professionalism involves an acceptance that forensic practitioners bear the burden of ensuring conclusions are effectively communicated to intended recipients, including investigators, attorneys, and the court. This means writing them down. This also means that they must be competent at the task of intelligible writing, and their reports must be comprehensive with regard to examinations performed, findings, and conclusions.

The suggestion that report writing has a particular value when rendering forensic conclusions is not at all new. Dr. Hans Gross wrote, for example, of the critical role that exact, deliberate, and patient forensic examination efforts play in investigative and forensic contexts. Specifically, he stated that just looking at evidence and forming opinions are the best practice. He argued that there is utility in reducing one’s opinions to the form of a report to identify problems in the logic of one’s theories (Gross, 1906, p. 439):

So long as one only looks on the scene, it is impossible, whatever the care, time, and attention bestowed, to detect all the details, and especially note the

incongruities: but these strike us at once when we set ourselves to describe the picture on paper as exactly and clearly as possible.

The “defects of the situation” are just those contradictions, those improbabilities, which occur when one desires to represent the situation as something quite different from what it really is, and this with the very best intentions and the purest belief that one has worked with all of the forethought, craft, and consideration imaginable. The experiences of the authors concur with those of Hans Gross. The act of preparing opinions in a written format, gathering references, forming supportive argumentation, and rendering deliberately crafted conclusions is a valuable step in the analytical process. It allows errors and omissions in any of these areas to be realized and helps to identify breaks in the logic of misinformed interpretation. Conversely, verbal conclusions should be viewed as a form of substandard work product. They are susceptible to conversions, alterations, and misrepresentations. They may also become lost to time. Written conclusions are fixed in time, easy to reproduce, and are less susceptible to accidental or intentional conversion, alteration, and misrepresentation. An analyst who prefers verbal conclusions as opposed to written conclusions reveals his or her preference for conclusive mobility. However, the forensic criminologist is often in a bind on this point, the prosecution and their agents must follow different rules of conduct than the accused. This has to do with the forensic landscape: the laws of discovery (a.k.a. disclosure) are not the same for both sides. Forensic examiners employed by the prosecution must document their involvement in every case

and write reports regarding their findings or face very serious penalties. However, those who work for defense attorneys are bound by the attorney-client privilege; they may be asked by their clients to refrain from writing a report of their findings for any number of legitimate reasons. In such cases, forensic criminologists should take scrupulous notes to augment the absence of a written report and be prepared to share them with the court upon request. As explained in Chisum and Turvey (2007), if a conclusion cannot be written down in a logical form, easily understood by all, then apart from having no forensic value, it is also likely to be wrong.

It has been said that language is a cumbersome engine for thought. No truer words have been spoken. This has certainly been the case in the forensic disciplines, where there has been little or no standardization of terms or their intended meaning. Each agency, each lab, each practitioner, it seems, uses its/his/her own language. As explained in Edwards and Gotsonis, 2009(p. 6–3):

...[M]any terms are used by forensic examiners in reports and in court testimony to describe findings, conclusions, and the degrees of association between evidentiary material (e.g., hairs, fingerprints, fibers) and particular people or objects. Such terms include but are not limited to “match,” “consistent with,” “identical,” “similar in all respects tested,” and “cannot be excluded as the source of.” The use of such terms can have a profound effect on how the trier of fact in a criminal or civil matter perceives and evaluates evidence. Yet the forensic science disciplines have not reached agreement or consensus on the precise meaning of any of these terms. Although some

disciplines have developed vocabulary and scales to be used in reporting results, they have not become standard practice.

This imprecision in vocabulary stems in part from the paucity of research in forensic science and the corresponding limitations in interpreting the results of forensic analyses, given these limitations, it is currently the onus of forensic criminologists to use plain language in report writing and to operationalize all significant terms used. They have a responsibility to become familiar with and write at the level of their intended audience, and they must define any key terms as they are being used to relate findings. Without precise definitions, and in the absence of forensic examiners to explain their word usage, the meaning of forensic reports is too often found in the eye of the beholder. In most instances, this involves a stakeholder in the outcome (i.e., an attorney) rather than a neutral party, making misinterpretation and misunderstanding a predictable hazard.

REPORT STRUCTURE

Apart from their relative permanence, written conclusions also provide forensic practitioners with the best chance to memorialize methods, interpretations, arguments, and the relevant underlying facts of a case as they understand them. However, forensic examiners are often bound by convention and policy. For example, those who work for the government will have specific policies to follow and forms to use when preparing their reports. These policies and forms vary widely with respect to relevance, content, and quality. The purpose of this section is to assist with the development of policies and standards which

conform with best practice, as provided in the recently published National Academy of Science (NAS) report: *Strengthening Forensic Science in the United States: A Path Forward*. Adapted from Chisum and Turvey (2007), and consistent with the recommendations of the NAS Report (Edwards and Gotsonis, 2009), a written forensic report should include, but need not be limited to, the following information:

1. Name(s) and date(s) of examination, with signature.
2. A preliminary background section, describing the forensic examiner's involvement in the case.
3. A chain of custody section, describing and detailing the evidence (material) that was examined or included in the examination.
4. A descriptive section, in which the forensic examiner thoroughly describes his or her examination and consideration of the facts and evidence.
5. A results section, in which the examiner lists any results and conclusions, including their significance and limitations, name, Date, and signature. It is a safe bet that most of those reading this text were taught the need for providing both name and date on every homework assignment, research paper, and exam during the first days of primary school. It is a habit that we either learn or suffer the consequences for ignoring. For a variety of reasons, many forensic reports lack one or both elements. In every forensic report, the examiner's name must be provided so that readers may be certain who did the work. Dates of various examinations must be provided so that readers may learn at which point they occurred within a given case, and their timing with respect to any other case activity or examinations. A dated signature line also is necessary so that readers

may verify the author of the report and when it was completed or submitted. Without this basic information, it is not possible for the readers to know who did what or when relative to anything else that happened. The lack of this information also allows for inaccurate suggestions that examinations were performed sooner or later than they should have been. And finally, on days when examiner testimony is needed, failing to include this information on a report allows agencies to send available personnel to court rather than those who actually did the work. This circumstance leads to testimony in which the court or the trier of fact may assume that the examiner (or a supervisor) on the witness stand performed work that he or she actually didn't.

Preliminary Background Section

The preliminary background section of a report provides the forensic examiner's involvement in the case. It should include who hired the examiner, under what circumstances, and when that hiring occurred. The reason is that it is important to know which side was providing the examiner with information and whether the examiner's involvement was secured before or after certain events took place, such as an arrest or a previous conviction. For example, a forensic criminologist performing a postconviction review of a capital murder case for the defense deals with a completely different set of facts and evidence than one who is brought in by the police during the investigation before an arrest has been made. This section of the report may also include basic background information regarding the case, including the type of crime involved; the date, time, and location of the offense; and any relevant victim

information not otherwise mentioned in the report. This information is meant to provide a quick thumb- nail sketch of the case that is useful to those glancing at the report for its con- text. It also has utility to forensic examiners, who may use this information to refresh their memory while testifying on the stand with report in hand.

Chain of Custody section

The chain of custody section of the report provides the materials examined, where they came from, and when. In this section, examiners make clear which facts and evidence they are relying on, and where they might be found, so that others may check their work if necessary. At this point, it is necessary to distinguish between legal and scientific sufficiency of evidence. Legal standards have no hold over scientific methods of examination. In other words, what is sufficiently reliable for legal purposes may not be sufficiently reliable for inclusion in a forensic examiner's report, and the oppo- site is also true. It is the forensic criminologist's responsibility to know the dif- ference to make it clear to the court when necessary. As Thornton explains (1994, p. 476):

Although there is a forensic science profession in the United States, and although many of us spend much of our time in courts of law, we have for the most part been passive spectators to the court decisions that deal with the admissibility of scientific evidence. In one sense, this is as it should be. It is the job of the law, and not of science, to determine how science is to be used in the courts. But in another sense, our passivity has served both ourselves and the

legal system poorly. It is the job of science, and not of law, to determine what good science is and what is not. And as Thornton further notes (1994, p. 483):

Every scientist understands that there are courts of law. By and large, they are accorded respect. I am not as certain that every lawyer understands that there are courts of science as well. They are not as easily identified because they do not exist in a particular point in space, nor is there one man or woman in a black robe that symbolizes the court, nor a marble anteroom outside smelling of urine and industrial strength disinfectant. Courts of science are constructs of the mind, which bring clarity and coherency to scientific and technical matters. They are built not of marble, but from the scientific method. Every scientist is expected to serve as his or her own presiding judge, and if a costume is necessary, it is a white lab coat instead of a black robe. But these courts have certain rules also, just as courts of law. And the scientist who declines to practice his or her profession by the rules of science will soon find that he or she has earned only the derision of his or her colleagues, and eventually finds that he or she cannot continue to practice at all. Ultimately, forensic examiners must determine whether evidence is sufficient and reliable for their examinations. That is to say, is there enough evidence of sufficient quality to examine, and are the results of the examination going to be reliable enough to carry any conclusions? The courts, at a later point, will determine whether or not this is admissible. One does not necessarily hinge on the other, nor should it.

D e s c r i p t i v e s e c t i o n

In the descriptive section of the report, the forensic examiner should describe the types of examinations performed and the steps involved before results were achieved. This description may require a single sentence, a short paragraph, or several pages. Failure to provide this information deprives third-party reviewers of knowing precisely how evidence was handled by the examiner and potentially filtered or even altered.

R e s u l t s S e c t i o n

In the results section of the report, forensic examiners should describe the nature and extent of ANY findings subsequent to their examinations not just the findings they like or can explain clearly, but ALL findings from EVERY examination performed.

In the presentation of findings, forensic criminologists will find themselves using statements that suggest varying degrees of confidence. They may even become accustomed to using vague terms or terms of art such as probably, likely, identify, match, consistent with, and reasonable degree of scientific certainty, to qualify the probability of findings. Without proper limits, this language can be misleading to those it is intended to assist. Conclusions expressed with confidence statements must be qualified and explained to the point of absolute clarity (Turvey, 2008). Without a high degree of internal clarification, findings may be misunderstood, misrepresented, and misapplied. Edwards and Gotsonis (2009) provide the following general advisory (p. 6–3):

Forensic science reports, and any courtroom testimony stemming from them, must include clear characterizations of the limitations of the analyses, including associated probabilities where possible. Courtroom testimony should be given in lay terms so that all trial participants can understand how to weight and interpret the testimony. In order to enable this, research must be undertaken to evaluate the reliability of the steps of the various identification methods and the confidence intervals associated with the overall conclusions. When forensic criminologists have given findings, written or otherwise, there must remain no question as to whether the findings are certain and no question as to how certainty was established. After all, the purpose of presenting findings is to clarify the evidence, not muddle it, a common Brady violation, often committed out of nothing more than ignorance, is related to the forensic practice of labeling a finding or report “inconclusive.” There are forensic practitioners employed by the government, from fingerprint analysts to DNA technicians, who erroneously believe that inconclusive or indeterminate findings are not an actual result. Therefore, they feel comfortable withholding the existence of such tests and related findings by virtue of failing to write them up in a report or failing to disclose those kinds of reports to the defense. Inconclusive findings are, however, relevant to the reconstruction of a crime, the nature and extent of examinations performed, the evidence they were performed on, the quality of any testing, the competency of the examiner, and the legal proceedings that hinge upon the weight the court places on evidence of every kind. They are a result, just not one that is expected or even desired and they must not be ignored.

Fact Checking

Before preparing the final draft of a forensic report, forensic examiners should take care to check that facts relied upon are accurate and up to date. When they are working for the government, this means relying on supervisors, colleagues, and law enforcement investigators. However, when they are working privately, forensic examiners may rely on their clients (the attorneys) and their investigators, either of which may have a more accurate and even encyclopedic knowledge of the case facts. It is therefore proper to allow either the clients or their investigators to fact-check the final report. They may even suggest questions that the forensic examiners failed to answer. It is improper, however, for attorneys or investigators to suggest changes as to final conclusions. Forensic examiners must stand behind their methods and results and not be swayed by those who have a stake in the outcome of legal proceedings that will be informed by them.

Sample Report

Forensic Examination Report

To: Lubogo and Company Advocates

From: Isarel Y.K, MS, P.O. Box 2175 Kampala

Date: October 17, 2021

Re: Kirstin “Blaise” Lobato case

On July 8, 2001, the deceased body of Duran Bailey was found behind a garbage dumpster in an unlocked, three sided cement enclosure on Kapeeka Road in Kamwokya. According to witness statements, he was homeless and

slept in this location at night. Kirstin “Blaise” Lobato is charged with his murder.

In August of 2005, this examiner was asked by Advocate Maragaret and Zalkin to examine the forensic evidence in this case with respect to both a possible reconstruction of events and a motivational analysis of the offense behavior.

Between September 16th and October 3rd of 2005, this examiner received material related to this case from Attorney Margaret, including, but not limited to:

1. CPS Department crime scene evidence list
2. Crime scene diagram
3. Arrest and Incident Reports
4. Crime Scene and Evidence Reports
5. Investigator’s Reports
6. Voluntary Statements of Witnesses
7. Forensic Laboratory Reports of Examination
8. Crime scene and autopsy photos
9. Autopsy report of Duran Bailey
10. Autopsy Evidence Form
11. APL toxicology report
12. Preliminary hearing testimony
13. Trial testimony of Dr. Kyeyune
14. Kamwoya Coroner’s Investigation reports
15. Reports and Testimony of Criminalist Tom Wabwire, Forensic Lab
16. Report and Testimony of Joel Mutana, fingerprint examiner

17. Report and Testimony of Defense reconstructionist, George Opio

18. Reports and witness statements related to the sexual assault w/ weapon of Diann Nakabbi on 7/1/01

On October 1 of 2005, this examiner visited the crime scene, during both daylight hours and evening hours with Attorneys Margaret and Zalkin, and Investigator James.

On October 5th, 2005, Investigator James faxed this examiner an undated copy of “FOLLOW-UP NOTES” from the Kamwokya Coroner’s Office by Investigative Staff Supervisor William Gaza relating to the death of Duran Bailey. It was advised that these notes had just been sent from the Coroner’s office, and had not been discovered previously.

F i n d i n g s

After a careful review of the facts and information provided, it is the opinion of this examiner that:

1. There is no physical evidence associating Kirstin “Blaise” Lobato, or her vehicle (a red 1984 Fiero), to the crime scene.
2. The offender in this case would have transferred bloodstains to specific areas of any vehicle they entered and operated.
3. The failure of Luminol to luminesce at any of the requisite sites in the defendant’s vehicle is a reasonably certain indication that blood was not ever present, despite any conventional attempts at cleaning.
4. There are several items of potentially exculpatory evidence that were present on or with the body at the crime scene but subsequently not submitted to the crime lab for analysis.

5. A primary motive in this case is directed anger expressed in the form of brutal injury, overkill and sexual punishment to the victim's genitals.

6. The wound patterns in this case may be used to support a theory of multiple assailants.

Discussion

1. There is no physical evidence associating Kirstin "Blaise" Lobato to the crime scene.

According to Forensic Lab Reports by Criminalist Thomas Wahl, all of the evidence from the body or the crime scene that he was asked to examine excluded Ms. Lobato. This includes: TAW 1, item 10 & 1P: DNA from left and right fingernail clippings of Duran Bailey. TAW 3, item 16: DNA from saliva on a wad of chewing gum found at the scene with victim's blood on it. TAW 10, items 7, 8, & 9: DNA from blood sample and control swabs from sandal at scene. TAW 6, item 2: a pair of Nike Air shoes collected from Ms. Lobato were negative for blood. TAW 7, item 2: an aluminum baseball bat collected from Ms. Lobato was negative for blood. TAW 8, item 2: a seat cover collected from Ms. Lobato's vehicle was negative for blood. TAW 11, item 10: small pieces of unknown wax like trace evidence with "silver colored paper" collected from Duran Bailey's rectum at autopsy were not associated with Ms. Lobato's vehicle or any item associated with her.

None of the footwear seized from Ms. Lobato by the Police could be associated with the crime scene or the bloody footwear impressions found leading out of the crime scene area.

None of the tire tracks found at the scene by the LVMPD were associated with Ms. Lobato's vehicle.

None of the fingerprint examinations performed by the police associated Ms. Lobato with the scene or the crime.

2. The offender in this case would have transferred bloodstains to specific areas of any vehicle they entered and operated.

After stabbing the victim so many times, cutting off the victim's penis, moving the victim, and walking around in the victim's blood in such a confined space, the offender would have had blood on their hands and feet at the very least.

This would necessarily result in bloody footwear impressions on the ground leading away from body, which was the case. It would also necessarily result in bloody transfer to the interior and exterior door handles, the steering wheel, the gearshift, the driver's side floor pads, and any of the foot pedals. This transfer, even if wiped or washed away with conventional cleaning agents, would be detectable using Luminol.

3. The failure of luminol to luminesce at any of the requisite sites in the defendant's vehicle would be a reasonably certain indication that blood was not ever present, despite any conventional attempts at cleaning.

Consider the following scientific facts regarding Luminol testing in a forensic context: When Luminol oxidizes, it glows in a process called chemiluminescence. It's not the blood that glows in a positive Luminol reaction, but the iron in the blood that makes the Luminol glow. Luminol oxidation is catalyzed by the presence of metal ions such as copper, iron, and cyanide. As blood dries, it turns brownish and rusty colored; Fe (2) oxidizes to Fe(3). Consequently, the

older the bloodstain, the more intense the reaction with Luminol. Luminol is extremely sensitive; studies have shown that it can detect blood in 1 part per million (1:1,000,000). This includes blood that may be found in urine. Luminol is sensitive enough to pick up minute traces of blood even when attempts have been made to wash it away with various cleaning agents such as bleach and ammonia. Luminol tests cannot distinguish between human blood and animal blood. Brass, bronze, and similar alloys containing copper can give false positives for blood when using Luminol. Luminol reacts with some cleaning agents, including certain bleaches, Fast Orange, The Works, Fantastic and Babo Cleanser. Luminol reacts with many different kinds of vegetation.

What this all means is that it takes considerable effort to clean any visible bloodstain from clothing to such a degree that Luminol would fail to detect evidence of its presence. This is in no small part why Gaennslen (1983) reports that (pp. 247–248):

A number of compounds have been used for the [presumptive] tests, and in particular the test is often named after the chemical compound that is used. Some of the compounds are: benzidine, phenolphthalein, leucomalachite green, ortho-tolidine, tetramethylbenzidine, ortho-dianisidine, and luminol.

Most authorities agree that positive presumptive tests alone should not be taken to mean that blood is definitely present. A positive test suggests that the sample could be blood and indicates [the need for] confirmatory testing. On the other hand, a negative presumptive test is a reasonably certain indication that blood is absent, although in rare circumstances an inhibiting chemical could be present.

This is in agreement with the testimony of police Criminalist Thomas Wahl (pp. 964–965): Luminol is used primarily to determine or to detect the possibility of blood being present on something that cannot be seen with the naked visual eye. And perpetrators do attempt, have been known to attempt to wash out blood from certain items such that they cannot be seen visually with the naked eye and that's why Luminol is an important tool in crime scene investigation to try to be able to detect blood that's not visually apparent and may have been washed out or diluted.

According to Criminalist Wahl, the vehicle seat cover (TAW 8, item 5) and the interior left door panel (TAW 9) of Ms. Lobato's vehicle: yielded weak positive presumptive tests for the presence of blood in one area of each item. Human blood could not be confirmed from either item. Human DNA was not detected in extracts prepared from swabbings collected from both items.

Consequently, it is most accurate to say that no blood of any kind was found in Ms. Lobato's vehicle. Furthermore, it is a reasonable scientific certainty that no blood was ever transferred to those areas in or on the car where Luminol results were negative. This precludes the possibility that the person who committed this crime also entered and operated Ms. Lobato's vehicle immediately after its commission.

4. there are several items of potentially exculpatory evidence that were present on or with the body at the crime scene, but subsequently not submitted to the crime lab for analysis.

“SEXUAL ASSAULT KIT, DOE, JOHN”

This item appears to be a sexual assault kit performed on the victim in this case, Duran Bailey. According to the Autopsy Evidence Form by CSA Maria Thomas, this sexual assault kit contains combed pubic hair and a penile swab. At the very least, the penile swab and any pubic combings should be tested for DNA in order to confirm or refute the theory that any particular person had sexual contact with the victim prior to death.

It must be noted that the victim’s actual penis was not collected and retained as an item of evidence, and was apparently buried with the victim’s body (re: communication with Investigator James Aleman on October 5, 2005).

“CIGARETTE BUTTS”

These items may or may not be the cigarette butts evident in scene photography the cigarettes in that photograph are located on the victim’s right abdomen, left thigh, and left hand. For example, if the cigarettes in the photograph taken are associated with a single expended paper match located on his right thigh.

The cigarettes in that photograph are associated with what appears to be ash in the same area, the cigarettes in that photograph may also be associated with dark injuries described vaguely under Chest and Abdomen; as “scattered irregular and curvilinear pressure marks” these cigarette butts were located under a plastic bag that shielded them from the garbage that was subsequently placed on top of the body. This associates them more directly with the crime and any related activity. Each cigarette could be examined for latent prints and

tested for DNA to confirm or refute the theory that any particular person was at that location after the victim's pants were pulled down, but before the plastic bag was placed over the victim's body.

Uncollected Item "White Paper Towels"

By way of comparison according to the recently discovered FOLLOW-UP NOTES from the above example referencing observations at the scene on 07/09/01 on the first page:

The decedent's penis had been cut off, but the testicles remained. There were what appeared to be white paper towels stuffed in the open wound in this area.

This examiner is unable to locate any reference to white paper towels (or any other paper towels) having been collected from the body at the scene, or submitted to the lab for latent or bloody print examination. This item, having been placed into the wound by the offender, could have contained valuable exculpatory evidence that is now apparently irrecoverable.

A primary motive in this case is directed anger expressed in the form of brutal injury, overkill and sexual punishment to the victim's genitals.

According to Turvey (2002, p. 307) motives are the "emotional, psychological, and material needs that impel and are satisfied by behavior." There is no profit motivation evident in this case as, the victim is homeless, has no valuables, is indigent and obviously so to all.

There are no power motivations evident in this case, as these involve only the force necessary to commit the offense (a robbery, rape or homicide). They do not involve overkill. Intense, directed anger is evidenced in this case by the combination of brutal force, lethal force, overkill, and the time spent with the

victim inflicting superficial cuts and performing peri/post-mortem sexual mutilation.

Brutal and lethal force is evidenced in this case by repeated injuries that inflict tremendous damage until death results: the cumulative blunt force trauma, stab wounds, and incise wounds to the victim's face, neck and head. These include, but are not necessarily limited to: The contusion to the back of the scalp; The 4.5-inch superficial incised wound to the left neck. Multiple abrasions and contusions to the left side of the face and head; Multiple abrasions and contusions to the right side of the face and head; The 1.2-inch stab wound to the anterolateral right forehead; The superficial incised wound group to the left lateral neck; The pre-mortem stab wound evident to the remaining scrotum; The stab wound and associated 2.5-inch incise wound on the anterolateral left neck; The stab would to the left chin; The 0.6-inch stab wound to the anterior neck; The 1.2-inch incise wound above the right eye; The multiple superficial incise wounds in near the left eye and eyelids. The multiple lacerations of the lips, associated with the fractures and avulsions of the teeth; The 75-inch incise wound on the chin; The 2.8-inch incise wound to the left upper chest.

Overkill is evidenced by injury that goes beyond what is needed to kill the victim, including, but not limited to: the postmortem removal of the penis and associated partial removal of the scrotum; the incise wound to the rectum; the incise wound to the perineum; the four postmortem stab wounds to the upper abdomen. It is a common misapprehension that this kind of sexual mutilation (cutting off the victim's penis; incising the victim's rectum) may suggest a female attacker. In the context of a homicide, this form of sexual mutilation is

almost exclusively associated with male victims killed by male offenders. In such cases, one or more male offenders kill a male victim and remove his penis in the peri/ post-mortem interval to: satisfy jealousy, spite or rage relating to real or perceived sexual rivalry; punish or torture the victim for a real or perceived wrong retribution; collect a trophy; feminize a victim in an attempt to “normalize” a sexual assault.

Moreover, a nationwide Westlaw search of state and federal appellate cases revealed only 16 homicides where an adult victim’s penis was actually cut off. In all but one case it was a male, or a group of two or more males, who committed the murder and the ultimate removal of the victim’s penis.

Most of the cases involved brutal attacks to the victim prior to death, even torture in some cases, and evidence of overkill. 7 of the cases involved multiple male offenders (2–8). More than 1/3 of the cases involved homosexual offenders.

Notably, the alleged circumstances in only one case involved a female acting alone to attack, subdue, and remove the penis of an adult male victim—*Nv v. Kirstin Blaize Lobato*.

The wound patterns in this case may be used to support a theory of multiple assailants. The wound patterns and bloodstains in this case evidence that the victim was attacked in the location where he was found, that he fought back at first given the defensive injuries on his hands and forearms, but that he was ultimately overpowered and unable to physically resist.

The victim was subsequently beaten, cut, and stabbed repeatedly all over the face, head, neck, and abdomen from all directions and with multiple weapons (at least one blunt force object and one sharp force object).

It would be irresponsible not to suggest the theory that more than one person was involved in the attack on the victim given the following:

Evidence of multiple weapons; multiple injuries at a wide variety of locations from multiple directions; and stab and incise wounds of varying lengths and depths.

It is important to note that the available physical evidence does not disprove this possibility. Nor does the case material suggest that this issue has been seriously explored or properly addressed by any of the forensic experts in this case.

Depending on the expert asked to opine on a given case, reports of various types can range in length and quality. This can be the result of many factors, including a lack of education on how to write a report properly, the format to be used, what to include, and so on. No matter the reasoning, though, there is no excuse for deficient reporting at any time, let alone when the opinions given should be of court quality. To serve their purpose then, forensic criminologists must be competent at the task of intelligible writing, and their reports must be comprehensive with regard to examinations performed, findings, and conclusions. It is also critically important for criminologists to operationalize the terms which they are using to explain their findings, to use a standard

format when writing their reports, as well as to include their name, signature, and the date. When conducting their analyses for court, forensic examiners must determine whether evidence is sufficient and reliable. That is, is there enough evidence of sufficient quality to examine, and are the results of the examination going to be reliable enough to carry any conclusions? The courts, at a later point, will determine whether or not this is admissible. When forensic criminologists have given findings, written or otherwise, there must remain no question as to whether the findings are certain and no question as to how certainty was established. Forensic criminologists and other examiners should also make themselves open to and seek out opportunities for fact checking and peer review. These are crucial components of any robust examination.

Review Questions 1. Why is it important for forensic criminologists to write down their conclusions? 2. What does it mean to operationalize the terminology which is being used? Why is this important? 3. Describe some of the necessary sections in a forensic report. 4. Why might forensic examiners prefer not to include their name and signature on a given report tenured to the court? 5. What is involved in the chain of custody section of a forensic report? Why is this important information for the court? 6. What is the difference between legal and scientific sufficiency of evidence? 7. T/F Forensic examiners should include all findings from every examination performed in their report. 8. What is fact checking? Why is it important to fact check before submitting a report?

CHAPTER TWELVE



COGNITIVE ETHOS OF THE FORENSIC EXAMINER (PROCEDURE FOR FORENSIC SCIENCE)

The appropriate response to complexity should not be to call in the witch doctor for a magic spell, but rather to demand the best science available and remain aware of its limitations. Faigman, Kaye, Saks, and Sanders (2004)

The forensic criminologist is a scientific forensic examiner charged with analyzing and interpreting case-related evidence or applying criminological theory to case-related issues, within the objective constraints of the scientific method. After obtaining findings or results, forensic criminologists are segregated from the many other kinds of scientists, and even criminologists in

Hypothesis: An educated estimate regarding the possible answer to a question or problem. **Legal Truth:** Information and events that have been established by a court ruling based on a narrow factual record—either at the discretion of a judge or jury.

Metacognition: “[t]he ability to know how well one is performing, when one is likely to be accurate in judgment and when one is likely to be in error” (Kruger and Dunning, 1999, p. 1121).

Observation: The action of observing something regarding some event, fact, or object.

Observer Effects: The outcomes present when the results of a forensic examination are distorted by the context and mental state of the forensic examiner to include the examiner's subconscious expectations and desires.

Role Strain: The difficulties or strain caused by contradictions inherent in one's role. **Scientific Fact:** Information and events that have been established based on a broad factual record to a reasonable degree of scientific certainty by scientists using the scientific method.

Scientific Method: A way to investigate how or why something works, or how something happened through the development of hypotheses and subsequent attempts at falsification through testing and other accepted means.

Scientific Principles: The scientific theories which have stood the test of time and independent study. **Scientific Theory:** A premise which may be stated or presented with a reasonable degree of scientific certainty.

Ultimate Facts: The facts that allege the substance of a cause of a legal action, distinct from those that merely describe events related to the action.

Ultimate Issue: The legal question before the trier of fact; it relates to legal findings of guilt, innocence, or, in a civil matter, liability.

Ultimate Issue Doctrine: A principle which holds that witnesses are prohibited from giving an opinion on the ultimate issue of a case.

As servants to the justice system, they fully expect their work to be used in the education of investigators, attorneys, judges, and jurors—commonly in that order. As explained in Thornton and Peterson (2002, p. 148):

What then, of the forensic scientist? The single feature that distinguishes forensic scientists from any other scientist is the expectation that they will appear in court and testify to their findings and offer an opinion as to the significance of those findings. The forensic scientist will, or should, testify not only to what things are, but to what things mean. Forensic science is science exercised on behalf of the law in the just resolution of conflict. It is therefore expected to be the handmaiden of the law, but at the same time this expectation may very well be the marina from which is launched the tension that exists between the two disciplines.

Unlike the research criminologist whose findings are bound for publication in a professional journal, or the university lecturer who speaks before students and colleagues from an arrangement of PowerPoint slides, the forensic criminologist ultimately renders expert opinions and interpretations in reports, affidavits, declarations, depositions, and expert testimony before the court. This is almost always under the penalty of perjury. In this context, the consequences for society, and the penalties to the forensic criminologist, for falsity, incompetence, and inaccuracy are more than academic. Before we embark on that part of our journey in subsequent chapters. However, we need to consider how actual forensic scientists are meant to think.

Forensic criminologists unfamiliar with their own cognitive ethos their peculiar nature of acquiring knowledge and understanding are mentally lost. They cannot know if they are unbiased, rational, or even competent. Consequently, they cannot know whether they are practicing good science, let alone whether they are practicing science at all. This calls to mind the wise assertion that “[i]f there is no science, there can be no forensic science” (Thornton and Peterson, 2002, p. 162). The purpose of this chapter is to help readers acquire both knowledge and understanding in the manner that every kind of forensic criminologist must to help develop their cognitive character. It is about mapping out how to best meet the analytical needs of forensic practice, but also how we commonly fail in the effort. First, we will define the essential components and directives of good scientific practice. Then we must provide some of the basic rules and expectations in the forensic realm, as this is likely to be foreign territory. Finally, we will chart a course through the realm of failed reasoning, applying these concepts to forensic criminology. To begin with, let us attend to the scientific method.

THE SCIENTIFIC METHOD

[M]any, perhaps even most, forensic scientists are not just inattentive to the scientific method, but ignorant. Dr. John I. Thornton¹ (1994, p. 485) A full embrace of the scientific method and its underlying philosophy is the best way to ensure competent methodology, findings, reasoning, and interpretations. This requires a forensic criminologist who “objectively and skeptically employs the scientific method” (Kennedy and Kennedy, 1972, p. 5). Unfortunately, the criminal justice community as a whole, to include forensic

criminologists, remains uninformed regarding what the scientific method is and what it intends. Faigman et al. (1997, p. 47) are rather unforgiving, but honest, when observing:

The subject of the scientific method ... has been described innumerable times, in a multitude of works on manifold subjects, from elementary school textbooks to post-graduate treatises. And yet it remains a subject that is foreign to most lawyers and judges. Thornton and Peterson (2002, p. 159) go further, including the majority of forensic practitioners in the mix of those who do not understand what the scientific method is or how to apply it correctly:

But those individuals engaged in “scientific” work rarely study the scientific method. To be sure, those engaged in research are expected to pick up the scientific method somewhere along the way; for the most part scientists don’t study the implementation of the scientific method. Philosophers of science think about the scientific method. Basic research scientists use it to generate new knowledge. Applied scientists typically study the knowledge that the scientific method has managed to accumulate. For example, the chemist studies the hydrogen bond, and the biologist studies the double helix of DNA, but rarely does either receive instruction concerning the scientific method per se. It is not only possible, but indeed is generally the case, that a person with a Bachelor’s Degree in chemistry, geology, biology, or other scientific discipline, has not had a single college lecture on precisely how the scientific method works.

This ultimately works against the best interests of the forensic scientist, who ordinarily does not learn much about how undiscovered information is brought to light.

The failure of scientists in general and of forensic scientists in particular, to understand how knowledge is acquired and applied, leads to abuse. In Criminology, as a consequence of these conditions, one is barred from assuming that every- one is working from the same page in a discussion of what science is and how the scientific method is meant to be employed. Even scientists may be clueless on these questions. Some further, basic explanations are necessary.

Step by step: science as falsification as explained in the first chapter, the scientific method is a way to investigate how or why something works, or how something happened, through the develop- ment of hypotheses and subsequent attempts at falsification through testing and other accepted means. It is a structured process designed to build scientific knowledge by way of answering specific questions about observations through careful analysis and critical thinking. Observations are used to form testable hypotheses, and with sufficient testing, hypotheses can become scientific theo- ries. Eventually, over much time, with precise testing marked by a failure to fal- sify, scientific theories can become scientific principles. An excellent discussion is provided in Edwards and Gotsonis (2009, pp. 4–11):

The methods and culture of scientific research enable it to be a self-correcting

enterprise. Because researchers are, by definition, creating new understanding, they must be as cautious as possible before asserting a new “truth.” Also, because researchers are working at a frontier, few others may have the knowledge to catch and correct any errors they make. Thus, science has had to develop means of revisiting provisional results and revealing errors before they are widely used. The processes of peer review, publication, collegial interactions (e.g., sharing at conferences), and the involvement of graduate students (who are expected to question as they learn) all support this need. Science is characterized also by a culture that encourages and rewards critical questioning of past results and of colleagues. Most technologies benefit from a solid research foundation in academia and ample opportunity for peer-to-peer stimulation and critical assessment, review and critique through conferences, seminars, publishing, and more. These elements provide a rich set of paths through which new ideas and skepticism can travel and opportunities for scientists to step away from their day-to-day work and take a longer-term view. The scientific culture encourages cautious, precise statements and discourages statements that go beyond established facts; it is acceptable for colleagues to challenge one another, even if the challenger is more junior. The forensic science disciplines will profit enormously by full adoption of this scientific culture. The scientific method is, ultimately, the particular approach to knowledge building and problem solving employed by scientists of every kind. The first step in the scientific method is observation. An observation is made regarding some event, fact, or object. This observation then leads to a specific question regarding the event, fact, or object, such as where or when an object

originated or how an object came to possess certain traits. The second step in the scientific method is attempting to answer the question that has been asked by forming a hypothesis, or an educated estimate, regarding the possible answer. Often, there is more than one possible answer. These answers must be investigated and developed, considering all possible alternatives. The third step in the scientific method is experimentation. Of all the steps in the scientific method, this is the one that separates scientific inquiry from other forms of investigation. Scientists must design experiments intended to disprove their hypotheses. Once again, they must design experiments intended to disprove their hypotheses—not to prove them. Any research study or laboratory experiment designed to prove a hypothesis or theory suffers from confirmation bias, and is not, by definition, scientific.² If one calls oneself a scientist yet fails to follow these basic steps, then something other than science is being practiced. The absolute cornerstone of the scientific method is falsification, as described by Sir Karl Popper (1902–1994), the Austrian-British scientific philosopher.

FORENSIC SCIENCE AS FALSIFICATION

These considerations usually lead to conclusions as follows.

1. It is easy to obtain confirmations, or verifications, for nearly every theory if we look for confirmations.
2. Confirmations should count only if they are the result of risky predictions; that is to say, if, unenlightened by the theory in question, we should have expected an event which was incompatible with the theory an event which would have refuted the theory.
3. Every “good” scientific theory is a prohibition: It forbids certain things to happen. The more a theory forbids, the better it is.
4. A theory which is not refutable by any conceivable event is nonscientific. Irrefutability is not a virtue of a theory (as people often think) but a vice.
5. Every genuine test of a theory is an attempt to falsify it, or to refute it. Testability is falsifiability; but there are degrees of testability: Some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks. In the science of cognitive psychology, confirmation bias (a.k.a. confirmatory bias) is the tendency to search for or interpret information in a way that confirms one’s preconceptions. It involves actively seeking out and assigning more weight to evidence that confirms a hypothesis or theory, and ignoring or undervaluing evidence that could disconfirm a hypothesis or theory.
6. Confirming evidence should not count except when it is the result of a genuine test of the theory; and this means that it can be presented as a serious

but unsuccessful attempt to falsify the theory. (I now speak in such cases of “corroborating evidence.”)

7. Some genuinely testable theories, when found to be false, are still upheld by their admirers for example by introducing ad hoc some auxiliary assumption, or by reinterpreting the theory ad hoc in such a way that it escapes refutation. Such a procedure is always possible, but it rescues the theory from refutation only at the price of destroying, or at least lowering, its scientific status. (I later described such a rescuing operation as a “conventionalist twist” or a “conventionalist stratagem.”)

One can sum up all this by saying that the criterion of the scientific status of a theory is its falsifiability, or refutability, or testability, (sir Karl r. popper, 1963, pp. 33–39).

If a hypothesis remains standing after a succession of tests or experiments fail to disprove it, then it may become a scientific theory. As such, it may be stated or presented with a reasonable degree of scientific certainty. Scientific theories that withstand the test of time and independent study eventually become scientific principles. There is no universal agreement as to whether and when a scientific theory crosses the threshold to become a scientific principle. It is, however, accepted that a scientific theory, necessarily developed with the assistance of the scientific method, has a greater degree of reliability and validity than mere observation, intuition, or speculation. Science requires doubt and skepticism at all junctions. It is not about making friends or impressing colleagues. Useful instructions for the forensic criminologist are found in Kennedy and Kennedy (1972, p. 4):

To be objective, an inquirer should be prepared to accept and record whatever facts he may encounter. He must not let personal feelings affect what he sees or hears. Although he does not need to like the nature of the information, he must be willing to investigate it. When such an investigation is begun, it must be carried through with a degree of skepticism. Skepticism does not imply cynicism or a distrust of the world. It only suggests that the [forensic criminologist] must be prepared to distinguish truth from the opinion or inclinations of others. The authors have noted that the lesson of science as skeptical falsification is all but lost in modern classrooms. The rare student who has been exposed to the scientific method will routinely believe, for lack of informed instruction or general inattentiveness that scientists are meant to prove given theories with their various methods and research efforts. This is reflected in exams, in class- room discussions, in thesis papers, and ultimately in published research. Science does not seek confirmation; science seeks eradication. The failure to remove an idea or theory with the direct application of facts supporting every skeptical postulation available proves its strength. Conversely, the failure to apply skeptical postulations to a theory proves the doubts of those who fear its eradication.

OBSERVER EFFECTS

The majority of criminal justice and criminology education is oriented toward government, corrections, and law enforcement employment. When applied subjects are offered, they are taught by government-employed practitioners to give the program an affiliation that will smooth the way for student intern-

ships and future student employment. Subsequently, most forensic practitioners learn of, and go to work for, the police, the prosecution, or the prisons. At least at the beginning of their career, this tends to be true. The nature of this educational pathway creates a pro-prosecution bias in philosophy and practice that is very difficult to unseat, or even to perceive as harmful. As cognitive psychologists have repeatedly documented, tested, and proven, “[t]he scientific observer [is] an imperfectly calibrated instrument” (Rosenthal, 1966, p. 3). The imperfections of such observers stem from the fact that subtle forms of bias, whether conscious or unconscious, can easily contaminate their seemingly objective undertakings. Observer effects are present when the results of a forensic examination are distorted by the context and mental state of the forensic examiner, to include the examiner’s subconscious expectations and desires.

Identifying and curtailing this kind of bias is a considerable task when one takes into account the forensic community’s aforementioned affiliation with both law enforcement and the prosecution. Specifically, this association has fashioned an atmosphere in which an unsettling number of forensic professionals have all but abandoned objectivity and have become completely partial to the prosecution’s objectives, goals, and philosophies [Giannelli (1997) discusses how the forensic community’s structural configuration has created many pro-prosecution forensic scientists]. They may even go so far as to regard this association as virtuous and heroic, and believe any alternative philosophy to be a manifestation of something that is morally bankrupt, as previously discussed. So strong is the influence of this association between

forensic science and law enforcement that some forensic examiners have even deliberately fabricated evidence, or testified falsely, so that the prosecution might prove its case; however, this is the extreme end of the spectrum.

See, generally, the Forensic Fraud Archive, which is a database of more than a hundred cases involving forensic and law enforcement experts who have provided sworn testimony, documents, or reports intended for the court that contain deceptive or misleading information, findings, opinions, or conclusions. Located online at http://www.corpus-delicti.com/forensic_fraud.html.

As Professor D. Michael Risinger and colleagues (2002, p. 9) explained in their groundbreaking law review article on observer effects in forensic science, many different forms of observer effects exist: “At the most general level, observer effects are errors of apprehension, recording, recall, computation, or interpretation that result from some trait or state of the observer.” These covert biases are more concerning than deliberate fraud and misconduct because they are often misperceived, or even thought of as beneficial, and therefore tend to go undetected. Consequently, to blunt their impact, scientists and researchers must be aware that these influences exist and can indeed significantly influence their analyses. Once conceded, they can be studied and understood; once understood, they can be addressed and even mitigated. The vast majority of scientific disciplines accept the need to blunt examiner bias and observer effects as a given, and it is reflected in their published research. Put simply, “[s]ensitivity to the problems of observer effects has become integral to the modern scientific method” (Risinger et al., 2002, p. 6).

THE FORENSIC PERSPECTIVE

To be a good scientist, one must embrace and execute the scientific method until it is second nature. One's approach to problem solving must be objective and skeptical. One must also seek to recognize and blunt observer effects. Such practice and traits must be an inseparable part of one's professional identity—known to all and doubted by none. This is also necessary to the sound practice of forensic criminology. However, it is only part of the equation. Being a good scientist in no way ensures forensic knowledge or ability. Each year, many competent scientists are hired into forensic service. Most are enlisted directly from university. They may enter the forensic realm as a freshly minted graduate to be employed at entry level in a government agency, or as a seasoned professor to be employed as a forensic consultant. Unless these individuals have had specific education in the forensic sciences by someone who is practicing it, whether in the area of criminology or not, they will arrive for their first court appearance with little knowledge of what is happening—even as it happens. Despite being given a forensic role or job title, they will not understand their function, their responsibilities, or even the very laws that govern their conduct—sometimes belligerently so, depending on their professional and intellectual character. The purpose of this section is to help alleviate that condition with some basic instruction. It is important for readers to understand that the intersection of scientific and criminal justice ambition is problematic at best—whether you are practicing in Australia, Canada, the United Kingdom, or the United States. The mandates of science are frequently in direct conflict with the needs of investigators, the desires of attorneys, and

even the rule of law as decided by various courts. The criminal justice system is like a great flowing river. Each mile of the river has its own tides and currents, or laws and rules; and each requires very different things. Consequently, scientists are at a terrific disadvantage when they practice within the justice system. This must be conceded at the outset of any forensic endeavor. As explained in Thornton (1983, pp. 86–88):

Basic conflicts that influence the practice of forensic science become apparent at the interface of law and science. Law and science on occasion have conflicting goals, each having developed in response to different social and attitudes and intellectual needs. The goal of law is the just resolution of human conflict, while the goal of science traditionally has been cast, although perhaps too smugly, as the search for “truth.” Certainly there is nothing intrinsically dichotomous in the pursuit of these goals; the court or jury strive in good faith to determine the truth in a given situation as a way to resolve conflicts. But proof is viewed somewhat differently by law and science, as is the application of logic and the perception of societal values.

Numerous writers have commented on these differences, including Glanville Williams in his *Proof of Guilt* (1958):

“The principles of [the legal system] are not the product of scientific observation, but embody a system of values. These values do not necessarily have to be changed with the march of knowledge of the material world... The rule conferring upon an accused the right not to be questioned... may be a good or a bad rule, [but it] has certainly not been made better or worse by the invention of printing or the aeroplane.” ...

How, then, do these differences between law and science lead to abuse of forensic science? They do simply because all the players want to win and are likely to use any ethical means at their disposal to do so. The attorneys in a case are aligned with only one side, and it is entirely appropriate under the adversary system for them to advocate a particular point of view, even without full and fair disclosure of all relevant facts. Subject only to the rules of evidence, the rules of procedure, and the Code of Professional Responsibility, attorneys are free to manipulate scientific evidence to maximize the opportunity for their side to prevail. Not only is behavior of this sort countenanced by the law, it is the ethical responsibility of counsel to attempt to do so. In fact, the domains of science and law are so divergent and so foreign to each other's purpose that one legal authority argues against academic and research criminologists testifying in adversarial proceedings at all (Ingraham⁴, 1987, p. 179):

Barton L. Ingraham is a former Harvard-educated lawyer with a doctorate in criminology from Berkeley. After practicing law in 10 different states for more than a decade, he retired to academia and is currently an Associate Professor at the Institute of Criminal Justice and Criminology at the University of Maryland in College Park. He notes that the adversary "game" is not a procedure whose underlying purpose is to communicate facts or determine truth but rather to communicate position statements about reality, and ultimately the expert witness is forced into the role of a coadvocate selling a partisan position to the trier-of-fact rather than an impartial source of information. He subsequently argues that "criminologists are not ethically justified" in testifying as expert witnesses because in the final analysis, the expert witness from the social

sciences participates in a process which cannot, by reason of its structure and the people who operate it (lawyers and judges), lead to an objective understanding of scientific knowledge. Therefore, because of the ethical principles to which most academicians subscribe... a social scientist, such as a criminologist, cannot ethically participate in what amounts to a circus of illusion and deception.

The authors of this text do not share this view in its entirety. It is true that in the negotiation of justice, science may be selectively employed, wholly ignored, and terribly abused by those managing the justice system. The virtues of scientific fact and subsequent expert inferences can be easily muddied by skilled counsel or quelled by a cautious or ignorant judge. With this in mind, forensic practitioners must free themselves to not just anticipate but also assume that their findings and related testimony will be, at best, misrepresented by attorneys making arguments on both sides of the courtroom once they have left the witness stand. And that it may be misunderstood by the court. It is consequently their duty to report findings and testify in such a manner as to prevent this from happening whenever possible. The authors of this text would argue that it is not unethical to participate in the adversarial process for fear that science and facts will not carry the day; rather, it is unethical for scientists to withhold their knowledge, skills, and ability from a process that so desperately needs it. They have a duty to make a faithful scientific record for honest agents within the criminal justice system to find and set to use. Criminologists who refuse to educate the criminal justice process on moral grounds lose their

moral authority to criticize its outcomes as a consequence. So while the legal system is not necessarily concerned with science or truth, this makes the participation of scientists all the more necessary. However, it's not at all easy. In fact, the less one knows about the criminal justice system, the simpler it likely seems. To assist readers with navigating this professional cloverleaf, we would offer the following points of regular concern—without which scientists may find their standards and conduct easily misled. It should be noted that while the rules and laws mentioned are specific to the United States, the scientific philosophy and sentiment are universal.

1. The Federal Rules of Evidence. The Federal Rules of Evidence (FRE) govern the admissibility of facts as evidence in the United States Federal Court. Many states have adopted these rules, or a close variation, to govern the admissibility of facts as evidence at the state court level. Moreover, they are taught in law, criminal justice, and even some forensic science programs across the United States. It is fair to argue that they are a regularly updated legal touchstone. The section on Opinions and Expert Testimony are particularly relevant to the forensic criminologist (FRE, 2006, pp. 13–15):

OPINIONS AND EXPERT TESTIMONY

If the witness is not testifying as an expert, the witness' testimony in the form of opinions or inferences is limited to those opinions or inferences which are (a) rationally based on the perception of the witness, and (b) helpful to a clear understanding of the witness' testimony or the determination of a fact in issue,

and (c) not based on scientific, technical, or other specialized knowledge within the scope of Rule 702. (As amended Mar. 2, 1987, eff. Oct. 1, 1987; Apr. 17, 2000, eff. Dec. 1, 2000.) Rule 702. testimony by experts if scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Bases of opinion testimony by experts

The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence in order for the opinion or inference to be admitted. Facts or data that are otherwise inadmissible shall not be disclosed to the jury by the proponent of the opinion or inference unless the court determines that their probative value in assisting the jury to evaluate the expert's opinion substantially outweighs their prejudicial effect.

Opinion on Ultimate issue

(a) Except as provided in subdivision

(b), testimony in the form of an opinion or inference otherwise admissible is not objectionable because it embraces an ultimate issue to be decided by the trier of fact.

(c) No expert witness testifying with respect to the mental state or condition of a defendant in a criminal case may state an opinion or inference as to whether the defendant did or did not have the mental state or condition constituting an element of the crime charged or of a defense thereto. Such ultimate issues are matters for the trier of fact alone.

Disclosure of Facts or data Underlying expert opinion.

The expert may testify in terms of opinion or inference and give reasons therefor without first testifying to the underlying facts or data, unless the court requires otherwise. The expert may in any event be required to disclose the underlying facts or data on cross-examination.

a. Timing of Disclosure

Brady is a trial right, not a pretrial disclosure rule. Nevertheless, exculpatory evidence must be disclosed in time for defense counsel to make use of it. Here, as with the discovery rules discussed above, delayed disclosure may place a defendant in an untenable position. In *Ex parte Mowbray*, [943 S.W.2d 461 (Tex. Crim. App. 1996)] a murder case, the prosecutor used a blood spatter expert to refute the defense suicide theory. According to the prosecutor, his

case “depended upon” this evidence. Prior to trial, the prosecution retained another expert, Herbert MacDonell, considered the premier expert in the field. After reviewing the crime scene, the physical evidence and the photographs, MacDonell concluded months before trial that “it was more probable than not that the deceased died from a suicide rather than a homicide.” Yet the defense did not receive his written report until ten days before trial and then only after the trial judge threatened sanctions. MacDonell never testified. The court wrote,

... State’s counsel early on recognized the potential lethal effect of MacDonell’s testimony on their theory of the case, and beginning in November and continuing until May they engaged in a deliberate course of conduct to keep MacDonell’s findings and opinions from Applicant’s counsel until the last days before trial. Even then they caused Applicant’s counsel to believe MacDonell would be a witness and available for cross-examination.

b. “Exculpatory” Requirement

Brady does not apply unless the evidence is exculpatory. Consequently, labeling a laboratory report as inconclusive may relieve the prosecution of the disclosure requirement. For example, in one case an inconclusive handwriting report “was not exculpatory, but merely not inculpatory.” [United States v. Hauff, 473 F.2d 1350, 1354 (7th Cir. 1973)] Similarly, a report showing that hair from a rape defendant was not found at the scene of the crime was deemed a “neutral” report. [Norris v. Slayton,

However, as one court correctly understood, [S]uch a characterization [as neutral] often has little meaning; evidence such as this may, because of its

neutrality, tend to be favorable to the accused. While it does not by any means establish his absence from the scene of the crime, it does demonstrate that a number of factors which could link the defendant to the crime do not. [Patler v. Slayton, 503 F.2d 472, 479 (4th Cir. 1974)]

Similarly, in *Bell v. Coughlin*, [820 F. Supp. 780, 786–87 (S.D.N.Y. 1993)] the prosecution failed to turn over FBI ballistics test results to the defense. The lab positively matched a cartridge shell (B3) to the .45 caliber pistol but reported that no conclusion could be reached with respect to the two bullets (J/R2 and J/R4) in its possession. Thus, although the results of the FBI tests may be characterized as mixed, they clearly contained exculpatory material. In a research facility, it may very well be standard procedure to discard undesirable or unhelpful results though it would be scientifically dishonest to conceal such a practice when publishing related research. However, in a forensic context, this practice is referred to as cherry picking: selectively reporting (and thereby emphasizing) only desired results or information rather than the entirety of examinations performed and results achieved. Specifically, this practice violates due process because:

1. The concealment of any examination performed on any item of evidence represents a break in the chain of custody for that item to those third parties involved in reviewing subsequent reports (i.e., judges, juries, attorneys, and independent forensic examiners). The defense in particular has a right to know of every individual who handled an item of evidence, what he or she did with it or to it and where, and in what order.

2. The execution of any examination on an item of evidence has a potential impact on its volume and quality (destruction, consumption, contamination, etc.). The nature of any impact on the evidence must be made clear to the police, court, and all of the attorneys involved in a case.

3. The failure to notify the police, court, or attorneys involved in a case regarding the existence of inconclusive examinations assists with concealing the causes behind such results. This can include errors in examination procedure, problems with the evidence itself, or individual examiner proficiency. Unless the cause of an inconclusive result has been unequivocally established, the impact on the interpretation of any subsequent or related results is unknown and potentially limiting.

4. The failure to investigate and report the cause of inconclusive results potentially conceals the error rate and/or the individual examiner proficiency rate related to a particular test. If these are unknown, then the scientific reliability of that test is not known. This may in turn create a false illusion of competence and proficiency in the mind of forensic examiners, their superiors, and the court. Inconclusive findings are clearly relevant to the reconstruction of a crime, the nature and extent of examinations performed, the evidence they were performed on, the quality of any testing, the competency of the examiner, and the legal proceedings that hinge upon the weight the court places on evidence of every kind. They are a result, just not one that is expected or even desired. Consequently, the failure to disclose such results is a violation of due process, and could foreseeably be conceived as an obstruction to justice which is in fact a criminal charge. This is, however, unlikely, as the police and

prosecutors very rarely sanction their own experts for conduct it generally encourages. Thus, such misconduct by government-employed scientists often goes unrecognized or uninvestigated. Consider the following case example of Brady in action, which highlights disparities between the agendas of law enforcement and science. Note that police investigators in particular want to clear and prosecute suspects in their cases. To accomplish these goals, they can lie to suspects about the existence of evidence or witnesses during initial interviews. In some states they are allowed to fabricate false reports and produce false evidence without fear of sanction; in others it is a crime. The laws and policies governing police conduct vary from agency to agency, and also with respect to jurisdiction. Matthew Christian is, as of this writing, a detective with the San Jose Police Department in California. He fabricated a report from the district attorney's crime lab with a phony lab analyst's name that "confirmed" the presence of semen on a blanket related to an alleged sex crime.

He then used this fabricated report during a suspect interview to gain an inculpatory statement. Unfortunately, he forgot about his deception and put the "ruse report" into his case file alongside a real lab report that contradicted it. The district attorney proceeded to trial thinking she had hard physical evidence denying several defense requests about the contradictory lab results. When asked about it on the stand during a preliminary hearing, Detective Christian falsely testified as though the fake lab report and analyst were real and the findings had been inculpatory. The fake lab analyst was even put on the district

attorney's witness list. Only when the defense was finally able to speak with the lab did.

In San Jose, the crime lab is a division of the district attorney's office. It is in fact called "Santa Clara County District Attorney's Criminalistics Laboratory." Detective Christianson used the district attorney's seal and official documents in making his phony report discover the confirmatory report was a fake. This information was forwarded to the district attorney, who had not verified the report.

In December of 2006, all charges were dropped against the accused (Griffy, 2007a). Detective Christianson remains on active duty with San Jose Police Department. The use of ruse reports remains standard practice.

Without the cover of Brady and the tenacity of alert defense counsel, the detective's error and his related misconduct might not have been revealed until during trial after the damage had already done by forcing the accused to appear in front of a jury.

Currently, Brady is only as good as the investigators and prosecutors who follow it, the judges who enforce it, and the defense counsel who understand and raise it as an issue. The general absence of prosecutorial sanctions for Brady violations has put the criminal justice system on the honor system in this regard. Scientific experts in their employ, therefore, have a tremendous responsibility to self-govern with respect to their evidence and its discovery. Their failure to comply, despite the cheers of the prosecution and the indifference of some trial courts, has repeatedly been the cause of reversal at the appellate level.

While scientists employed by the government are admonished to comply with Brady, scientists employed by the defense are admonished to work within the restrictions of the attorney-client privilege. This legal entitlement is intended to facilitate truthful communication and fully informed advocacy by a defendant's counselors. It protects the confidentiality of dealings between lawyers and their clients, but also extends to their agents, which includes expert consultants. If a scientific consultant renders a finding that is useful to the defense, he or she may be asked to write a report or declaration that will be discoverable to the prosecution under the rules of evidence, and even to give subsequent expert testimony before the court. If the consultant renders findings that are harmful to defense theories of the case, the forensic consultant may be kept within the privilege and expected to abide by it, that is, unless concealing findings presents an ethical conflict or facilitates a crime.

The rules for the accused and the rules for the prosecution are very different. In an adversarial system with the presumption of innocence and right to due process, they must be. And these rules will have nothing to do with the mandates of good science, but rather due process and its interpretation by a given court or government agency. Forensic criminologists must understand, expect, and conform to the nature of this imbalance to serve their role effectively and without prejudice. If they do not believe in these rules and their underlying assumptions regarding the rights of the accused, then they should not seek to serve in a forensic capacity.

In 1990, the same police department had been warned by the judiciary to cease the practice of creating phony lab reports. However, in 2002, “detective Juan Serrano [of the San Jose Police Department] described the use of ruse crime lab reports as ‘standard procedure’ at that time” (Griffy, 2007b)

Every defendant is entitled to objective scientific expert assistance. In the United States, forensic criminologists, regardless of their employer, must accept the legal principle that every defendant is entitled to an adequate defense, which includes reasonable access to scientific expert assistance should the need arise. This stems from the right of the accused to due process. Without adequate access to independent scientific assistance in the examination of evidence, or even interpreting the government’s findings, and set against the overwhelming resources of the government, due process cannot prevail. As explained in Giannelli (2005, p. 539):

In many criminal cases, securing the services of experts to examine evidence, to advise counsel, and to testify at trial is critical. As the commentary to the American Bar Association (ABA) Standards notes: “The quality of representation at trial ... may be excellent and yet unhelpful to the defendant if the defense requires the assistance of a psychiatrist or handwriting expert and no such services are available.” As early as 1929, Justice Cardozo commented: “[U]pon the trial of certain issues, such as insanity or forgery, experts are often necessary both for the prosecution and for defense [A] defendant may be at an unfair disadvantage, if he is unable because of poverty to parry by his own witnesses the thrusts of those against him.” Similarly, Judge Jerome Frank

observed in a 1956 opinion: “The best lawyer in the world cannot competently defend an accused person if the lawyer cannot obtain existing evidence crucial to the defense, e.g., if the defendant cannot pay the fee of an investigator to find a pivotal missing witness or a necessary document, or that of an expert accountant or mining engineer or chemist.” He went on to observe: “In such circumstances, if the government does not supply the funds, justice is denied the poor and represents but an upper-bracket privilege.”

The ABA Standards require adequate access to experts for both the defense and prosecution, and there are some statutory provisions for defense experts. For example, the Criminal Justice Act provides for expert assistance for indigent defendants in federal trials. The Act, however, limits expenses for experts to \$1,000.00 unless the court certifies that a greater amount is “necessary to provide fair compensation for services of an unusual character or duration.” But, as Judge Weinstein has noted, “The Act’s \$1,000 limit for defense experts is far too low ... and must be increased if due process is to be afforded defendants.” Many states have comparable provisions, but the monetary limits are often incredibly low—until recently \$250 maximum in capital cases in Illinois.

In *Ake v. Oklahoma*, [470 U.S. 68 (1985)] the Supreme Court recognized a due process right to a defense expert. The Court wrote: “[W]hen a State brings its judicial power to bear on an indigent in a criminal proceeding, it must take steps to assure that the defendant has a fair opportunity to present his defense.” This fair opportunity mandates that an accused be provided with the “basic

tools of an adequate defense.” Nevertheless, some courts have attempted to limit this right to capital cases or to psychiatric experts. This narrow application fits the facts in *Ake* but not its rationale. Other courts have imposed demanding threshold standards for the appointment of defense experts. If the threshold standard is too high, the defendant faces a “catch-22” situation, in which the standard “demand[s] that the defendant possess already the expertise of the witness sought.”

A number of sources indicate that the lack of defense experts continues to be a problem for indigent defendants. We mentioned the importance of *Ake* to the development of forensic criminology in the United States in Chapter 1. The legal entitlement to expert assistance provides a professional mandate to forensic experts wherein they fail the intentions of the criminal justice system should they select clients solely based on their alignment for or against a particular side. That is to say, the objective forensic criminologist has an obligation to perform examinations for whichever side approaches him or her first. If one is truly an impartial scientist, then one has no stake in the outcome and sides are a nonissue. If one’s examinations are truly scientific, and the results are unsusceptible to biasing influences, then it cannot matter to the scientist which side of a legal conflict asks that they be performed. The scientific facts must out for justice to be served. Refusal to work for either side based simply on the politics of alignment with one over the other, for fear of personal or professional sanction or out of a misplaced moral imperative, accurately telegraphs examiner bias. This also demonstrates that the objective scientific expert is one who is able and willing to work for either side in a legal

dispute, offering precisely the same interpretations under like fact patterns and circumstances regardless. The authors sympathize with government-employed forensic practitioners who may, by policy, be barred from practice outside their place of employment. The issue of examiner bias associated with such isolated forensic engagement will be discussed later in this chapter. However, we take note that many government forensic analysts enjoy a jurisdictional exception, where they may provide forensic services on private cases beyond the borders of their employer's influence to maintain an impartial practice while also avoiding obvious conflicts of interest. Employees of a county crime lab may privately consult on cases in other counties or in other states, for example. The same may also be true for those employed by police agencies. Similarly, forensic psychologists may work for a state hospital but may consult privately on matters out of state. Again, this is a matter of internal agency policy, not of law. Often, the refusal of forensic practitioners to work private cases for the defense is the result of the very real fear of being "blacklisted" by their prosecution-oriented friends and colleagues (to keep experts in line and forensic expertise aligned with the prosecution), or out of the belief that their work might help a guilty party go free. This second line of reasoning arrogantly assumes the ultimate issue of legal guilt, which will be discussed shortly. It also suggests a diminished view in the abilities of the prosecution, and an underlying belief that cases should not be tried with the full force of good science on the side of the accused. It suggests that the prosecution may not have a good case, or good evidence, and that subsequently its way should be

smoothed by the absence of competent analysis and testimony. These are not the holdings characteristic of a true scientist, let alone a forensic one.

The objective scientist is not a member of the adversarial “team.” While the criminal justice system necessarily sets two legal sides against each other the prosecution and the defense we have already explained that objective scientists do not take up the banner of either. In fact, their only value to the legal process is with respect to their objectivity. These scientists are there to advocate for evidence and its dispassionate interpretation nothing more. They can have no emotional, professional, or financial stake in the outcome. In other words, they cannot be paid to guarantee findings or testimony favorable to their employer, nor can their advancement be connected to the success of one party over another. This is, of course, separate from being compensated for time spent performing analysis and giving testimony. The second author (Petherick) is reminded of a discussion with a private forensic consultant who was, without discussing the specifics of the case, citing his involvement in a civil case. While outlining his involvement, the private consultant made the somewhat bold claim that “we are going to win this one.” When asked what he meant, the private consultant referred specifically to himself and the legal “team” that had sought his assistance, as though there was some right and wrong side of the legal argument. Such alignment is inappropriate and telegraphs a biased mindset. The division of investigative, legal, and scientific spheres exists to allow forensic practitioners to act as an objective foil to those who hire them whether they are attorneys or law enforcement investigators. As previously

discussed, investigators and lawyers have different goals and ethical considerations than do scientists. Each is admonished to act within the scope afforded his or her role, and not intrude upon that of the others. For example, lawyers at trial are interested in the facts and evidence that assist their case. The rest they are content to distort or simply ignore. This is discussed in Ingraham (1987, p. 183):

[O]ne often hears the following specious argument that the adversarial system has a built-in protection against the partial, partisan, and one-sided presentation of the evidence: “Not to worry. What is left uncovered by one side of the dispute will surely be brought out and highlighted by the other side. Before the case is over, the jury will have these facts in its possession. Moreover, it will have all the facts critically evaluated, their having passed through a searing test of rigorous cross-examination.”

...[I]t rarely works out this way. It is not always in the best interest of the other side to bring out evidence that has been omitted or obfuscated by opposing counsel; that evidence may be just as damaging to the “version” that the other side is pressing. Thus, quite frequently, both sides will obscure or omit facts essential for a just and impartial assessment of the event for tactical reasons, with the result that the jury never gets the full story. When scientists step outside their objective role, to withhold or distort relevant findings and in essence take sides, justice is perverted. Consider the example of then Sgt. Tom Bevel, a well-known bloodstain pattern analyst from Oklahoma. In *Oklahoma v. Smith* (1987), while employed by the police, serving as a senior officer for

the International Association of Bloodstain Pattern Analysts, and holding no scientific qualifications, he testified for the prosecution that he was a “blood expert” (p. 30). This is a statement that he clearly believed despite how ridiculous such testimony would appear to an actual serologist (a scientist specializing in the scientific study of blood). This characterization would allow Sgt. Bevel to testify before the court as an expert not only in bloodstain patterns, but as an expert with respect to the chemistry underlying tests for the presence of blood namely Luminol. Sgt. Bevel admitted under oath to performing Luminol tests on an item of clothing evidence (the defendant’s jeans) with negative findings that he made no record of in his one and only written police report.

These findings documented the absence of blood that should have been present for the prosecution’s theory of the case against the accused to be true. Concealing these negative findings by failing to report them could only assist the prosecution and hamper the defense in the preparation of their respective cases. The existence of Sgt. Bevel’s Luminol examination of the jeans findings did not come to light until mid-trial during the cross-examination of a forensic scientist from the police crime lab Janice Davis. Ms. Davis went out of her way to volunteer the existence of Luminol testing performed by Sgt. Bevel when responding to a general question about Luminol from defense counsel. The prosecution objected and informed the court that this was in fact the first time they were hearing about any such testing. Negative Luminol results strongly support the conclusion that the defendant’s jeans had not been stained

with blood at any time (Gaensslen, 1983). This chemical finding contradicted witness statements that the defendant had blood on his jeans that needed cleaning. As such, the results of the Luminol test that Sgt. Bevel administered were exculpatory evidence, which he conceded under cross-examination in the following exchange and sidebar involving M. L. Cantrell, attorney for Richard Smith and Michael Gahan, Asst. District Attorney for El Reno, Oklahoma (Oklahoma v. Smith, 1987, pp. 30–31): Q. Well, Sergeant, would it be fair to characterize you, in effect, as a blood expert?

a. I believe that's correct, yes, sir.

Q. If you were the blood expert in this case and, as you say, you conducted tests for splatters on the car and, I assume, tested chips and scrapings or supervised their testing, and tested with the luminol, why did you not include that in your report?

a. Well, at that particular time, I didn't see that it had any relevance. I discussed it with the detective on the case and really did not want to perform the examination in the first place, given what he had described as the condition the jeans were found in. In other words, we did it simply from his request. I certainly did not expect to find anything at all. And, of course, that was the case.

Q. Well you, of course, are an experienced officer and you understand that that is what is referred to as exculpatory evidence?

Mr. Gahan: Objection, Your Honor. The question calls for the witness to make a legal conclusion.



Mr. Cantrell: It calls for him to make a conclusion about evidence of a sort in which he is an expert at.

The Court: I'll allow inquiry into that area.

a. I'm sorry. Would you —

Q. Yes. You understand, of course, that that evidence which, of course, as you know, a negative test result is, in and of itself, a type of evidence, was of an exculpatory nature, do you not?

a. I would have to say at this point that I can agree with what you're saying, yes, sir.

According to the trial transcript, Sgt. Bevel admitted under oath that he understood the Luminol findings to be exculpatory, but saw no need to make a record of the test or the result. Just to be clear, since it did not help the prosecution, the Luminol test performed on the defendant's jeans was not reported or documented at all, and the findings were almost lost. In light of Brady, the bankruptcy of this sort of biased practice from those employed by the government should be evident to the objective forensic practitioner. Forensic practitioners must be judged solely based on how well they understand and apply the scientific method in their analysis, and the objectivity and transparency of their findings. This is a fundamental divide between investigators and lawyers on the one hand, and scientists on the other, that cannot be violated. Taking up an adversarial mission successfully violates that divide at the cost of due process. Just as forensic practitioners cannot lie without losing their scientific credibility, they cannot administer their practice in a partisan fashion without losing their impartiality. Unambiguous separation of the

forensic practitioner from the legal team is necessary to maintain that objectivity, as well as clarity of purpose for both. The partisan practitioner serves only vanity, and ultimately serves neither justice nor the law.

Scientific fact and legal truth are not the same. As already demonstrated, scientific fact and legal truth are very different propositions. Not only are they established by entirely different means, they are also sought for what can be incompatible ends. Forensic criminologists need to learn the difference to be able to maintain their scientific identity. Science seeks to find out what happened and why; the law seeks just resolution of legal conflict. These are not necessarily mutually exclusives ends, but they can be, as explained in Thornton and Peterson (2002, p. 148):

The courts are interested in forensic science only from the standpoint of how science may be used by the trier of fact to resolve technical issues. But there is a fundamental conflict here. The classical goal of science is the production of truth, while the goal of law is the achievement of justice.

Few forensic scientists harbor serious misgivings about the expectation of good science on the part of their clients, be they the police, the prosecution, or the defense bar; indeed, most forensic scientists are rather cynical on this point. The clients want good science and the truth if it will help their case. If good science and the truth will not help their case, they will willingly settle for poor science and something less than the absolute truth.

Most forensic scientists accept the reality that while truthful evidence derived from scientific testing is useful for establishing justice, justice may nevertheless be negotiated. Investigators gather facts for use in legal proceedings. Scientists use the scientific method to examine, establish, and interpret the facts and evidence available in a given case. The decisions reached by judges and juries, referred to as the triers of fact, are legal determinations based on a narrow picture of that evidence for the sake of justice. This disparity of roles and goals creates tension between the scientist and the court and can result in an unfortunate amount of misunderstanding and even hostility between the two. It is interesting to note that this situation can also create tension between the forensic criminologist and the public, should they hold themselves out improperly or should the public confuse scientific fact and legal truth without being corrected. Scientific fact refers to information and events that have been established based on a broad factual record to a reasonable degree of scientific certainty by scientists using the scientific method. Legal truth refers to information and events that have been established by a court ruling based on a narrow factual record either at the discretion of a judge or jury. Scientific fact is the result of objective and analytical deliberation; legal truth is the result of something else entirely, as explained in Thornton and Peterson (2002, p. 149): Scientific “truths” are established when the validity of a proposition is proven to the satisfaction of a prudent and rational mind. Legal “truths” are not established by the exercise of the scientific method, but by the processes of the adversary system.

The role of physical evidence in the administration of justice may reasonably be described as follows: Science offers a window through which the law may view the technological advances of our age. Science spreads out a smorgasbord of (hopefully) valid facts and, having proudly displayed its wares, stands back. The law now picks out those morsels that appear most attractive to it, applying selection criteria that may or may not have anything to do with science. These selection criteria may appear sensible, even obligatory to the law, but may appear illogical or even whimsical to science. By undertaking forensic practice, forensic criminologists accept this disparity and recognize their role as educators to the legal process. They are not final arbiters of legal outcomes. This distinction must be made clear at every opportunity to help avoid confusion and improper expectations. Conversely, despite the holdings of some misled jurists, the superior court (a.k.a. the trial court) is not the final arbiter of scientific fact. Rather, it determines the admissibility of evidence and legal outcomes until the next legal cycle, such as a postconviction hearing or appeal. Any position to the contrary ignores the reality of the appellate process, in which state or federal appellate and supreme courts can reverse lower court decisions. It also ignores the advent and impact of DNA exonerations and even false confessions. These provide recurring scientific proof that many in the United States are found legally guilty in court while being factually innocent of their alleged crimes. As explained in Uphoff (2006, p. 838):

The growing number of DNA exonerations and the attendant publicity surrounding these cases and other wrongful convictions sound an increasingly

loud [and] discordant note in the normal chorus of praise for the American criminal justice system. The ever-increasing number of exoneration cases has altered the way judges, lawyers, legislators, the public, and scholars perceive and ultimately portray the criminal justice system's accuracy. That is to say, its fallibility is becoming more and more apparent. Legal truth, then, is most accurately perceived as a function of the prevailing judgments in a given court at a given moment all susceptible to the scrutiny of appellate review, revision, and reversal. Given these considerations, students must be disciplined in, and alert to the need for, cleaving established scientific facts and interpretations from legal truth. They should work carefully to disallow one from clouding or intruding upon the other. They must also remain confident that scientific facts and interpretations are determined by means of the scientific method and are meant to exist in a sphere independent of the court. No legal finding can change or intrude upon a scientific fact or interpretation; it can only rule on its admissibility. Ironically, scientific facts and interpretations change legal findings almost daily. Should this perspective be lost, the student may grow into a practitioner who cannot tell one from the other or worse one who considers them to be the same thing.

The "ultimate issue" is the province of trier of fact. The ultimate issue is the legal question before the trier of fact (a.k.a. the judge or the jury). As explained in Black's Law Dictionary (Black, 1990), the ultimate issue is "That question which must finally be answered as, for example, the defendant's negligence is the ultimate issue in a personal injury action." That is to say, the ultimate issue

relates to legal findings of guilt, innocence, or, in civil matters, liability. The ultimate issue is meant to be determined by the trier of fact based on consideration of the ultimate facts, defined in Black (1990) as “facts which are necessary to determine issues in cases, as distinguished from evidentiary facts supporting them.” The judge decides what the ultimate facts of a case are, based on his or her deductions and good judgment as they relate to the evidentiary facts. This will be discussed further in the next section. The history of case law that prohibits forensic experts from intruding on the ultimate issue by directly answering these kinds of questions for the judge or jury is referred to as the Ultimate Issue Doctrine. This holds that witnesses are prohibited “from giving an opinion on the ultimate issue in the case. The rationale underpinning the ultimate issue rule is that expert opinion should not be permitted to invade the province of the jury” (Moenssens, Starrs, Henderson, and Inbau, 1995, p. 75) Careful readers will note that FRE 704, provided in a previous section, all but abandons the Ultimate Issue Doctrine, explaining that testimony “in the form of an opinion or inference otherwise admissible is not objectionable because it embraces the ultimate issue to be decided by the trier of fact.” Rather, the FRE require that expert opinions be “helpful.” However much subsequent case law retains the prohibition, with courts all across the United States unwilling to allow experts to give this kind of testimony, though there are exceptions (Moenssens et al., 1995) The rules of evidence and related case law are essentially conflicted on the question of ultimate issue testimony from forensic experts. This pretty much guarantees that experts will be asked to violate it by zealous advocates. In fact, it is customary in some courts. Forensic

criminologists must take notice of whether and how their findings intrude on the ultimate issues before writing reports, let alone taking the witness stand. Forensic practitioners routinely hold scientific findings or inferences within their respective fields that bear closely or directly on the ultimate issue. As explained in Moenssens et al. (1995, p. 76):

The problem regarding the ultimate issue limitation is simply that in complex cases involving issues beyond the abilities of a layman, a jury may need an expert's opinion on the ultimate issue in order to reach a fair verdict. Opinion on the issues of identity [i.e., DNA, fingerprint comparison, etc.], value, insanity, and intoxication, for instance, all border on what would be considered ultimate fact issues, yet they are generally held admissible. Forensic practitioners should, of course, be able and willing to educate the court as to scientific opinions related to and bordering on the ultimate issue, but they must fully acknowledge their limitations. Because scientific fact and legal truth do not abide by the same standards, forensic practitioners are necessarily barred from intruding on the ultimate issue when it involves a purely legal determination or subject matter that is beyond their area of expertise. The reasons for this are fairly straightforward: forensic practitioners are not generally experts at rendering legal conclusions within the complex considerations of regional statutes and case law that binds the average jurist; and, while they may hold opinions on many issues, not all of these are necessarily expert opinions. If the ultimate issue relates to a question that is within the practitioner's area of expertise, then it is disingenuous for the court

to bar the forensic practitioner from giving related testimony. However, this assumes that both the court and the practitioner are being careful to delineate the nature and scope of that expertise. This is not always the case. Some examples may be useful:

- A psychiatrist may be asked to give an opinion on the ultimate issue of competency or sanity in a pretrial hearing. As the interpretation of either is a question of mental character, this is properly within certain kinds of psychiatric and even psychological expertise. In such cases the ultimate issue of guilt is either conceded or irrelevant to the proceedings.
- A DNA criminalist may be asked to give testimony regarding the nature and probability of a particular DNA “match” at trial. He or she may then be asked a follow-up question regarding the identity of the contributor of a particular DNA sample. These are properly within their area of expertise assuming that the criminalist has sufficient education and training in probabilities and statistics. However, asking him or her to opine regarding the guilt or innocence of a particular person based on these findings would intrude on the ultimate issue in an improper fashion.
- An expert on rape or rape investigation may be asked to give testimony on the existence of injuries related to sexual assault, or false reports of sexual assault, and related indicia. Then he or she may be asked whether or not the case at hand involves a rape or false report. If the expert has expertise and evidentiary findings that bear directly on this issue, as well as a related expert opinion, then there is no reason for the court to exclude it. Rather, the expert

has a duty to refrain from delving into issues of ultimate legal guilt or innocence. He or she must stick with the scientific facts and make clear that he or she is not drawing any legal conclusions. This is analogous to a forensic pathologist testifying as to cause and manner of death and determining cause as a gunshot wound and manner as homicide (which is a crime, and subsequently an ultimate issue) without naming the person responsible. Suffice it to say that forensic criminologists should be ever mindful of the ultimate issue, and approach the question of whether and when they may violate it with great care. Sometimes they will be barred from doing so when it is clearly within their scope; sometimes they will be invited to do so when it is not. In either instance they must abide the rulings of the court even when they disagree. This brings us to our final point of major concern.

The judge is always right. The forensic realm is one of laws, not science. Science is merely an occasional guest. The forensic realm is generally presided over by judges. Barring misconduct, a judge's authority over his or her cases must be respected and his or her will conformed to. The judge decides who the experts are, what evidence is admissible, and how and when court will proceed. If one seeks to engage in forensic practice, one must accept this reality and the many disappointments that will necessarily follow. Consider the issues of evidence and experts. Evidence, as explained in Black (1990), is "testimony, writing, material objects, or other things presented to the senses that are offered to prove the existence or non-existence of a fact." This is consistent with Lilly (1987, p. 2), which provides that evidence is "any matter, verbal or physical,

that can be used to support the existence of a factual proposition.” Evidence in a forensic context is not a scientific designation; rather, it is a legal construct. Consider that any fact or finding gathered in relation to a legal proceeding is considered evidence until a judge says it is not. For example, documentation of a factual event may exist, such as a taped interview or a written confession or an exclusionary test result. However, a judge may determine that it is not admissible, for whatever reason, and that fact and related documentation may not be considered as evidence at trial. As direct result of this legal reality, the sum total of evidentiary facts under consideration by a judge or jury in a given case generally does not represent the entire picture of known facts or findings; rather, it is the court’s interpretation and reduction of the evidence based on its determination of what is and is not admissible. According to Black (1990) admissibility “as applied to evidence... means that the evidence introduced is of such character that the court or judge is bound to receive it; that is, allow it to be introduced at trial.” Trial judges have broad discretionary authority with respect to deciding the admissibility of any proposed evidence. It is in reality a complex and inconsistently applied legal heuristic whereby a judge determines which facts and circumstances may actually be introduced as evidence based on “material relevance.” Such determinations may be standardized for certain kinds of proposed evidence, or they may require an evidentiary hearing.

A forensic expert, according to FRE 702, is qualified by virtue of “knowledge, skill, experience, training, or education,” at the discretion of the judge. The entire concept of forensic expertise is a legal one, unrelated to scientific prac-

tice. That is to say, in the domain of science there are those who use the scientific method and those who do not. It is a question of objectivity, methodology, and competence. Everyone's work should be transparent and replicable. In the forensic realm, the court designates or "qualifies" experts: those with knowledge beyond that of the average layman. Some have misinterpreted this to suggest that being designated a forensic expert by the court is akin to recognition of mastery of a given subject. This is not the case: "expert" is a legal classification and not a scientific or professional one. Judges are meant to invoke standards for the admissibility of experts, such as Frye, Daubert, or Kumho,⁸ to screen out junk science or unproven methods of analysis. However, these are guidelines only and not requirements, as judges have, again, broad discretion with respect to admissibility of all things to include experts and expert testimony. In reality, judicial rulings on expert admissibility are partial to say the least, as discussed in Moreno (2004):

Judges routinely admit expert testimony offered by prosecutors, but frequently exclude expert testimony offered by the defense. A review of federal criminal court cases reveals that 92% of prosecution experts survive defense challenges while only 33% of defense experts survive challenges by federal prosecutors. A recent study of federal appellate criminal cases found that more than 95% of prosecutors' experts are admitted at trial, while fewer than 8% of defense experts are allowed to testify. Why do judges consistently fail to scrutinize prosecution experts? Maybe it is the uniform. The most common prosecution expert witness is a police officer or a federal agent. In state and federal criminal

trials, law enforcement experts are routinely permitted to testify to opinions and conclusions derived from their on-the-job experience and personal observations. Prosecutors rely on police officer experts most frequently in narcotics cases. In drug cases, law enforcement experts are often asked to interpret ambiguous words or phrases used by the defendant and/or his coconspirators. The purpose of, and problem with, this expert testimony is that it tells jurors precisely which inculpatory inferences they should draw from the factual evidence. At this point, our discussion must necessarily double back to the ground covered in the previous section regarding the distinctions between scientific fact and legal truth. The habits found in the assignment of expert status by the courts paints the very clear picture that scientific prowess and forensic expertise are not the same thing, as employment by the prosecution is far and above a more significant consideration in the forensic realm.

Frye v. United States (293 F. 1013, D.C. Cir. 1923) requires that expert testimony be generally accepted by the relevant scientific community; in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (509 U.S. 579, 1993), the Supreme Court held that Rule 702 superceded *Frye*, requiring scientific testimony to be “not only relevant, but reliable”; In *Kumho Tire Co. v. Carmichael* (526 U.S. 137, 1999), the Supreme Court held that *Daubert* “applies not only to testimony based on ‘scientific’ knowledge, but also to testimony based on ‘technical’ and ‘other specialized’ knowledge.”

These are just some of the rules of the court that forensic criminologists and other forensic practitioners must learn and abide. Readers should, in general,

take notice that few of the terms or definitions provided in this section has anything to do with the practice of science, the use of the scientific method, the establishment of scientific fact, or the inference of scientific opinion. The notion of experts, evidence, ultimate facts, admissibility, relevance, and even the ultimate issue exist purely as legal constructs. This additional set of terms, definitions, and rules can create role strain and lead to cognitive dissonance among even the most seasoned forensic practitioners.

Role Strain and Cognitive Dissonance

Forensic criminologists work within the convergence of science, investigations, and the law—and often academia. They may, within the hours of a single day, find themselves working with students, consulting with police officers, advising lawyers, testifying before judges, and even seeking advice from other forensic practitioners. Their circumstances are constantly changing, and each realm has its own set of values, rules, and expectations. With each transition, be it in thought or physical surroundings, they must consciously shift their mission gears. However, realms often collide.

The constant shifting of roles and the collision of multiple-role expectations can cause what sociologists refer to as role strain. As explained in Kennedy and Kennedy (1972, p. 16), role strain is a reference to the “difficulties and contradictions inherent in one’s role.” In private practice, forensic criminologists must abide by the often-incompatible principles of both science and law. This is compounded by the expectations of judges and lawyers. If the government employs them, agency policy and politics will ensure further tension. In some government bureaus “the culture of group loyalty and protection is

powerful” and attitudes develop where “loyalty to [coworkers] even corrupt ones exceed loyalty to the [agency] and to the law,” (Mollen, 1994, p. 5). As these conflicting rules, values, and circumstances compound, strain draws and weakens even the most honorable practitioners. When roles and expectations are in direct and irrefutable conflict, forensic criminologists must decide which duty is primary and which set of rules they are going to follow. Theoretically, science should win out: objectivity and skepticism are what give them value to the criminal justice system at all. In reality, however, acting objectively and skeptically comes at a cost. It can end friendships, it can earn one the derision of colleagues or supervisors, it can hamper promotions and pay raises, it can bring unwanted attention to individual errors and failings, and it can even get one fired. Role strain blurs matters further, and weakens the resolve to conduct oneself impartially.

Cognitive dissonance;

The mental discomfort or anguish that occurs when scientific integrity meets cultural, financial, and moral consequences is a form of cognitive dissonance. A useful explanation is offered in Seaman (2006, pp. 1109–1110):

The theory of cognitive dissonance... posits that people feel discomfort when they hold two discrepant cognitions in mind at once. As a result, they are driven to reconcile these cognitions by somehow bringing them closer to consonance. A paradigmatic instance of dissonance is presented when one’s beliefs conflict with one’s behavior or experience. And a paradigmatic response to such conflict, as predicted by dissonance theory, is rationalization. By rationalizing constructing reasonable justifications that appear to bring the

attitude and experience into consonance the person satisfies the psychological drive for coherence and reduces the discomfort of dissonance.

Humans are exceptionally adept at rationalization. Indeed, recent research suggests that at least some attitude change occurs automatically and without conscious processing. As dictated by self-affirmation theory, “thought and action are guided by a strong motivation to maintain an overall self-image of moral and adaptive adequacy” (Aronson, Cohen, and Nail, 1999, p. 128). If a fact or circumstance comes to bear which suggests or demonstrates that we are not good, capable, intelligent, or in control, we feel pressure to act. Reducing dissonance (a.k.a. disagreement, lack of harmony, etc.) helps restore a cohesive self-view. We do this by rationalizing and by seeking out confirmations of our beliefs while at the same time developing habits that keep us safe from contradictory materials, environments, and even individuals. We look for validation, and we scorn everything else. When scientists do this, they actually become part of the problem they are meant to help solve. Forensic criminologists experience cognitive dissonance in many ways, but commonly it involves confrontations with and violations of their scientific role: when they are compelled to disguise or conceal unfavorable findings, to veil error and ineptitude, and to generally take the side of one adversary over another. Others experience cognitive dissonance when they uncover and loathe reporting the misconduct of others. Too many of those employed by government agencies reconcile their cognitive dissonance by conforming to the real or perceived cultural values of their peers and employers, embracing the belief that the ends justify the means. Sometimes the ends are a paycheck and a pension; sometimes the ends involve cultural approval rather than abandonment; and

sometimes it means choosing what is believed to be morally right. In a discussion that again highlights the differences between scientific and law enforcement culture, McClurg (1999, pp. 412–413) provides the following:

Police officers rarely lie to intentionally convict innocent persons. They lie to convict those whom they believe to be guilty. And, in fact, the vast majority of criminal suspects are guilty. This is undeniably true in Fourth Amendment matters, the arena where most police lying occurs. In search and seizure litigation, incriminating evidence has been found in the possession of the suspect. The lying concerns not the factual guilt or innocence of the defendant. Rather, it usually involves the post hoc manufacturing of probable cause intended to justify the seizure of the incriminating evidence.

The findings of the Mollen Commission Report [Mollen, 1994] bear out the conclusion that police falsification in such matters occurs principally because of an end-means rationalization:

What breeds this tolerance (to falsification) is a deep-rooted perception among many officers of all ranks within the Department that nothing is really wrong with compromising facts to fight crime in the real world. Simply put, despite the devastating consequences of police falsifications, there is a persistent belief among many officers that it is necessary and justified, even if unlawful. As one dedicated officer put it, police officers often view falsification as, to use his words, “doing God’s work” doing whatever it takes to get a suspected criminal off the streets. This attitude is so entrenched, especially in high-crime precincts, that when investigators confronted one recently arrested officer with evidence of perjury, he asked in disbelief, “What’s wrong with that? They’re guilty.”

By elevating the importance of factual guilt in an individual case above their moral and ethical responsibilities to themselves and to the public they serve, many police officers have become conditioned to believe they are not acting wrongly when they lie to convict criminals. So deeply ingrained is this “end justifies the means” mentality that 29% of the respondents in the Orfield Study did not equate falsification of testimony at a suppression hearing with the crime of perjury. [Orfield, 1992] This rationalization becomes a huge problem when forensic criminologists working for or within a police agency are expected to go along with it. Or at least, it should. For some, the need to conform to peers and authority is simply too great an influence. As explained in Oleson (2007, p. 686):

C O U R T A P P O I N T E D E X P E R T S

(a) Appointment. The court may on its own motion or on the motion of any party enter an order to show cause why expert witnesses should not be appointed, and may request the parties to submit nominations. The court may appoint any expert witnesses agreed upon by the parties, and may appoint expert witnesses of its own selection. An expert witness shall not be appointed by the court unless the witness consents to act. A witness so appointed shall be informed of the witness’ duties by the court in writing, a copy of which shall be filed with the clerk, or at a conference in which the parties shall have opportunity to participate. A witness so appointed shall advise the parties of the witness’ findings, if any; the witness’ deposition may be taken by any party; and the witness may be called to testify by the court or any party. The witness shall be subject to cross-examination by each party, including a party calling the witness.

(b) Compensation Expert witnesses so appointed are entitled to reasonable compensation in whatever sum the court may allow. The compensation thus fixed is payable from funds which may be provided by law in criminal cases and civil actions and proceedings involving just compensation under the Fifth Amendment. In other civil actions and proceedings, the compensation shall be paid by the parties in such proportion and at such time as the court directs, and thereafter charged in like manner as other costs.

(c) Disclosure of appointment. In the exercise of its discretion, the court may authorize disclosure to the jury of the fact that the court appointed the expert witness.

(d) Parties' experts of own selection Nothing in this rule limits the parties in calling expert witnesses of their own selection.

Forensic criminologists are admonished to learn these rules, or their variations, in jurisdictions of anticipated testimony. Suffice to say that they exist in some form everywhere.

The rules for the defense and the prosecution are different and they must be, it comes as an unhappy surprise to many forensic practitioners that the prosecution, and their agents, must follow different rules of conduct than the accused and theirs. This is owing to the fact that we have an adversarial system and not an inquisitorial one. A fundamental virtue of our criminal justice system is that all defendants are presumed innocent. Consequently, all aspects of a criminal trial are loaded with this ideal. As explained in Nelson (2008, p. 713):

Unlike the inquisitorial systems of Continental Europe, our adversarial system erects numerous protections for the accused. Indeed, “[n]o principle is more firmly established in our system of criminal justice than the presumption of

innocence that is accorded to the defendant in every criminal trial.” This echoes Hardaway (2008, p. 271), which provides more historical background:

The presumption of innocence in favor of the accused is firmly ingrained in American jurisprudence. This fundamental principle has been traced to biblical origins and has been shown to be substantially embodied in Roman and Canon law. Early English legal scholars, as well as esteemed members of the court, have acknowledged this principle in varied recitations of the maxim that it is better to acquit ten guilty people than to convict one innocent person. The presumption of innocence places the burden of proving criminal guilt entirely on the government. In theory, the state must prove a defendant’s guilt beyond a reasonable doubt in order to obtain a conviction. As explained in Hardaway (2008, pp. 271–272):

The presumption of innocence does not automatically establish the burden of proof required to determine an accused’s guilt or innocence. The presumption is an instrument of proof created by the law in favor of one accused, whereby his innocence is established until sufficient evidence is introduced to overcome the proof which the law has created. The degree of proof required to overcome the presumption of innocence is defined by the prevailing burden of persuasion. Conversely, the defense has an entirely lower evidentiary threshold. Ideally, they must only prove the existence of a reasonable doubt to obtain an acquittal. Hardaway (2008) explains that although there are some clear interpretations regarding this standard, there has also been ongoing disagreement between courts regarding both the definition of reasonable doubt, and whether it must actually be explained to the jury (pp. 272–273):

P R O O F B E Y O N D A R E A S O N A B L E D O U B T

In the American criminal justice system, the accused must be proven guilty beyond a reasonable doubt. *Commonwealth v. Webster* [1850] is representative of the time when American courts began applying the beyond a reasonable doubt standard “in its modern form in criminal cases.” Writing for the majority, Chief Justice Shaw defined reasonable doubt as:

[N]ot a mere possible doubt; because everything relating to human affairs, and depending on moral evidence, is open to some possible or imaginary doubt. It is that state of the case, which, after the entire comparison and consideration of all the evidence, leaves the minds of jurors in that condition that they cannot say they feel an abiding conviction, to a moral certainty, of the truth of the charge ... but the evidence must establish the truth of the fact to a reasonable and moral certainty; a certainty that convinces and directs the understanding, and satisfies the reason and judgment, of those who are bound to act conscientiously upon it.

Many courts adopted Justice Shaw’s definition of reasonable doubt in the nineteenth century, with one court characterizing the instruction as “probably the most satisfactory definition ever given to the words ‘reasonable doubt’ in any case known to criminal jurisprudence.” [*People v. Strong*, 30 Cal. 151, 155 (1866)] However, while the Supreme Court has held that proof beyond a reasonable doubt is a constitutional requirement in every criminal trial and juries shall be instructed on the necessity of such proof, the Constitution does not require a definition of reasonable doubt as part of this instruction (Jackson

v. Virginia, 443 U.S. 307, 320 n.14 (1979) (explaining that “failure to instruct a jury on the necessity of proof of guilt beyond a reasonable doubt can never be harmless error”); Sullivan v. Louisiana, 508 U.S. 275, 278 (1993) (“[T]he Fifth Amendment requirement of proof beyond a reasonable doubt and the Sixth Amendment requirement of a jury verdict are interrelated [T]he jury verdict required by the Sixth Amendment is a jury verdict of guilty beyond a reasonable doubt.”). The Supreme Court’s lack of guidance on the instruction of the reasonable doubt standard has given rise to confusion and a wide lack of uniformity in the treatment of its definition among federal and state courts. Not only does the definition of reasonable doubt vary between courts, but the jurisdictions also diverge on whether or not a jury is to be instructed on the definition. This issue provides an excellent reminder to scientists that the law is not a series of unequivocal “if-then” statements that are clearly understood, rationally interpreted, and consistently applied. Each judge in each courtroom in every country interprets and applies the law in his or her own way.

On this particular matter, some believe in providing helpful definitions of key terms to juries; some believe in a “hands-off” policy to let jurors decide for themselves; and some can be found in-between. The result is a wide diversity with respect to understanding and application of the law by differing judges and courts, and frequent jury confusion. For their part, scientists in forensic practice are bound to accept these rules and circumstances in their approach, analyses, and interpretations—so long as they do not interfere with good scientific practice. For instance, they must not generally assume the guilt of a defendant as part of their analysis as this is the very issue to be decided at trial. Even in postconviction work, where guilt is a legal reality, this may be an issue

under review. In some cases, however, guilt will have been conceded by the defense, and such an assumption may be appropriate or even required by the court. Moreover, scientists employed by the prosecution have a very specific burden with respect to their findings and what is referred to as due process.

The 5th and 14th Amendments to the United States Constitution provide that the government may not deprive its citizens of “life, liberty, or property without due process of law.” This provision is essentially a fairness requirement. Ideally, citizens may only be tried and punished for crimes alleged by the state under the most impartial and unprejudiced conditions. Any condition or treatment that tends to bias a judge, jury, or the process as a whole in favor of the state is considered a violation of due process. Common examples include things like inadequate defense, access to legal counsel or private experts, and failure to disclose exculpatory evidence or witnesses. In reality, the government has more money, more resources to draw from, and often benefits from a presumption of guilt held by ignorant and even partial jurors. Under these conditions, due process is an ideal rather than a reality. To abide the mandates of due process, scientists employed by the government must conduct forensic examinations in such a way as to be transparent in their methods and findings. As explained in Edwards and Gotsonis (2009, pp. 6–3):

As a general matter, laboratory reports generated as the result of a scientific analysis should be complete and thorough. They should describe, at a minimum, methods and materials, procedures, results, and conclusions, and they should identify, as appropriate, the sources of uncertainty in the procedures and conclusions along with estimates of their scale (to indicate the level of confidence in the results). Although it is not appropriate and

practicable to provide as much detail as might be expected in a research paper, sufficient content should be provided to allow the nonscientist reader to understand what has been done and permit informed, unbiased scrutiny of the conclusion.

Some forensic laboratory reports meet this standard of reporting, but most do not. Some reports contain only identifying and agency information, a brief description of the evidence being submitted, a brief description of the types of analysis requested, and a short statement of the results (e.g., “The green, brown plant material in item #1 was identified as marijuana”). The norm is to have no description of the methods or procedures used, and most reports do not discuss measurement uncertainties or confidence limits. Many disciplines outside the forensic science disciplines have standards, templates, and protocols for data reporting. Although some of the Scientific Working Groups have a scoring system for reporting findings, they are not uniformly or consistently used.

Forensic science reports, and any courtroom testimony stemming from them, must include clear characterizations of the limitations of the analyses, including associated probabilities where possible. Courtroom testimony should be given in lay terms so that all trial participants can understand how to weight and interpret the testimony. In order to enable this, research must be undertaken to evaluate the reliability of the steps of the various identification methods and the confidence intervals associated with the overall conclusions.

In other words, notes and reports must be discovered to the defense in a timely fashion prior to trial. Scientists must willingly make themselves available to the defense for pretrial interviews about their methods and findings. They must not withhold, conceal, or distort their methods and findings—especially if their

findings tend to exculpate or exonerate the defendant. And generally they must treat the prosecution and the defense equally even if the police department or prosecutor's office signs their paycheck. In the United States, this is done to comply with a well-known and often- ignored legal standard passed down from the U.S. Supreme Court regarding evidence and its discovery to the defense in *Brady v. Maryland* (1963).⁵ In so doing, scientists are meant to help create equal access to the government's find- ings, prevent what is generally referred to as "trial by ambush," and seek to avoid miscarriages of justice. As explained in Gershman (2006, pp. 685–686):

Brady's holding is familiar to virtually every practitioner of criminal law: "[T]he suppression by the prosecution of evidence favorable to an accused upon request violates due process where the evidence is material either to guilt or to punishment, irrespective of the good faith or bad faith of the prosecution." This principle, according to the Brady Court, reflects our nation's abiding commitment to adversarial justice and fair play toward those persons accused of crimes. As the Court observed: "Society wins not only when the guilty are convicted but when criminal trials are fair; our system of the administration of justice suffers when any accused is treated unfairly." Indeed, by explicitly commanding prosecutors to disclose to defendants facing a criminal trial any favorable evidence that is material to their guilt or punishment, Brady launched the modern development of constitutional disclosure requirements. As experienced forensic practitioners are well aware, the high-minded language offered in Brady requiring timely disclosure of potentially exculpatory evidence stands in contrast to its interpretation and application. It was intended as a clear standard set forth for reasonable minds to appreciate and follow.

However, the adversarial nature of the criminal justice system, and the general lack of accountability for even blatant prosecutorial misconduct, has left Brady without the teeth it needs. This was in fact the conclusion offered in Gershman (2006, pp. 727–728):

Reflecting on the evolution of *Brady v. Maryland*, one is struck by the stark dissonance between the grand expectations of Brady, that the adversary system henceforth would be transformed from a “sporting contest” to a genuine search for truth, and the grim reality that criminal litigation continues to operate as a “trial by ambush.” The development variations of this rule exist in most adversarial legal systems. In Australia, for example, there is the Queensland Criminal Code Act of 1899, Chapter 62, Division 3, Subdivision C on “Disclosure” which is very similar. The UK criminal code is generally the same, with respect to legal disclosure of expert evidence and its foundation pretrial.

Of the Brady rule by the judiciary depicts a gradual erosion of Brady: from a prospective obligation on prosecutors to make timely disclosure, to the defense of materially favorable evidence, to a retrospective review by an appellate court into whether the prosecutor’s suppression was unduly prejudicial. The erosion of Brady has been accompanied by increasing prosecutorial gamesmanship in gambling that violations will not be discovered or, if discovered, will be allowed, and tactics that abet and hide violations. Finally, the absence of any legal or ethical sanctions to make prosecutors accountable for violations produces a system marked by willful abuse of law, cynicism, and the real possibility that innocent persons may be wrongfully convicted because of the prosecutor’s misconduct. Indeed, more than any other rule of criminal

procedure, the Brady rule has been the most fertile and widespread source of misconduct by prosecutors; and, more than any other rule of constitutional criminal procedure, has exposed the deficiencies in the truth-serving function of the criminal trial. The original language in Brady has been expanded by the Supreme Court to cover any and all potentially exculpatory information in control of the prosecution, the police, and their agents. This includes government-operated crime labs, as well as private labs and private experts contracted into government service. Unfortunately, ignorance regarding Brady remains even in these informed circles, as explained in Giannelli and McMunigal (2007, pp. 1517–1518):

The U.S. Supreme Court has extended Brady to cover exculpatory information in the control of the police. Some courts have explicitly included crime labs within the reach of Brady. In one case, the Supreme Court of California noted that a laboratory examiner “worked closely” with prosecutors and was part of the investigative team. The court concluded that the “prosecutor thus had the obligation to determine if the lab’s files contained any exculpatory evidence, such as the worksheet, and disclose it to petitioner.” [In re Brown, 952 p. 2d 715, 719 (Cal. 1998)]

In another case, a court wrote that an experienced crime lab technician “must have known of his legal obligation to disclose exculpatory evidence to the prosecutors, their obligation to pass it along to the defense, and his obligation not to cover up a Brady violation by perjuring himself.” [Charles v. City of Boston, 365 F. Supp. 2d 82, 89 (D. Mass. 2005)] While the expert should have been on notice about perjury, it is less clear that the Brady obligation would be known to lab personnel—without the prosecutor tutoring the lab. How often do

prosecutors discharge this duty? Many lab examiners have never heard of Brady.

One common Brady violation, often committed out of nothing more than ignorance, is related to the forensic practice of labeling a finding or report “inconclusive.” There are forensic practitioners employed by the government, from fingerprint analysts to DNA technicians, who erroneously believe that inconclusive or indeterminate findings are not an actual result. Therefore, they feel comfortable withholding the existence of such tests and related findings by virtue of failing to write them up in a report, or failing to disclose those kinds of reports to the defense. Consider the discussion and examples provided in Giannelli and McMunigal (2007, pp. 1515–1516):

M E T A C O G N I T I O N A N D C O G N I T I V E F A I L U R E

Most people are familiar with peer pressure, and understand the instinct to fit in, but most of us do not understand how insidious the need to conform truly is. Researchers have found that even when there was no extrinsic reward whatsoever subjects would provide obviously incorrect answers to easy questions, simply to belong. Far more terrifying than mere conformity, though, is our obedience to authority. More dangerous than garden-variety conformity, obedience implies acquiescence to an authoritative command.

This position created by pressure from peers can be seen in a variety of situations from the first days of schooling to the early and in some cases the latter stages of one’s career and may manifest itself in a variety of ways and circumstances. Rather than hold fast their scientific perspective and principles, it is undoubtedly easier for “embedded” forensic criminologists to follow the

path of least resistance and adapt beliefs, attitudes, and behaviors that are rewarded, or at the very least not punishable, within a foreign culture such as those found in law enforcement or the courtroom. Knowing about cognitive dissonance and self-affirmation tendencies is a big step toward alleviating their harmful effects. Mental discipline is the next. Forensic criminologists have a scientific duty to hold their objective mandates as primary and remain alert of their own cognitive dissonance.

Not all falsity and incompetence are deliberate or subconsciously influenced by cognitive dissonance or observer effects. Many practitioners in the forensic community use incompetent methods and weak or flawed logic simply because they do not know any better. At the most basic level, these individuals are unaware that what they are doing is inept because they lack the cognitive ability to recognize their own incompetence. This relates to an area of cognitive psychology known as metacognition. Metacognition (a.k.a. metamemory, meta-comprehension, and self-monitoring) refers to “the ability to know how well one is performing, when one is likely to be accurate in judgment, and when one is likely to be in error” (Kruger and Dunning, 1999, p. 1121). At a fundamental level, metacognition can be conceived of as thinking about thinking. For metacognitive ability to engage, there must first be a level of self-awareness. This entails explicit knowledge that one exists separately from other people in full recognition of one’s capabilities, strengths, weaknesses, likes, and dislikes. Then forensic practitioners must possess the requisite knowledge relating to their particular field to be able to perform competently; they must know the basic principles and practice standards that they should employ and be able to explain why. Finally, they must have the cognitive capacity to stop

or pause during the performance of a task or examination, reflect on their work and results, apply critical thinking skills, and critique their own performance to that point. It has been demonstrated that, with respect to the nature of expertise, novice practitioners tend to possess poorer metacognitive skills than do expert practitioners, for lack of experience confronting their own errors or with problem solving particular to the geography of their domain. Moreover, Kruger and Dunning (1999, p. 1122) have suggested that, based on these findings, “unaccomplished individuals do not possess the degree of metacognitive skills necessary for accurate self-assessment that their more accomplished counterparts possess.” As Kruger and Dunning (1999, p. 1121) explain:

[W]hen people are incompetent in the strategies they adopt to achieve success and satisfaction, they suffer a dual burden: Not only do they reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the ability to realize it. Instead ... they are left with the mistaken impression that they are doing just fine. We refer to this particular phenomenon as metacognitive dissonance—believing oneself capable of recognizing one’s own errors in thinking, reasoning, and learning, despite either a lack of evidence or overwhelming evidence to the contrary. General examples include believing oneself to be knowledgeable despite a demonstrable lack of knowledge; believing oneself to be incapable of error despite the human condition; believing oneself to be logical in one’s reasoning despite regular entrapment by logical fallacies; and believing oneself to be completely objective despite the persistence of observer effects. Miller (1993, p. 4) explains: “It is one of the essential features of such incompetence that the person so afflicted is incapable of knowing that he is incompetent. To have

such knowledge would already be to remedy a good portion of the offense.” By our making clear the nature of the scientific method, in combination with observer effects, role strain, and cognitive dissonance, which are compounded by working under the strains of the forensic realm, we hope that the remedy of awareness has at the very least been successfully provided.

Case example Consider the case of the late Dr. Baldev Sharma (tragically murdered in 2007, at the age of 72, during a carjacking). He was hired into the forensic profession by an inept fraud, and lacked the ability to grasp, let alone accept, just how incapable he was as a forensic scientist. Indeed, Dr. Sharma held a doctorate in organic chemistry from Delhi University in India. He started his career at a pharmacology lab in Delhi, and after moving to the United States, he took a job for the City of Houston Department of Public Works where he tested drinking water. From there, and without any forensic qualifications or training, he was recruited to work for the Houston Police Department Crime Laboratory in 1989. As explained in Patterson (2008):

What happened inside Houston’s crime lab remained largely unknown until reporters began showing up and Houston City Council, in March 2005, was obligated to authorize a comprehensive, independent investigation. Michael Bromwich, a former inspector general for the U.S. Department of Justice, spent two years at his task and last year posted his 400-page final report on the Web. The failure of the crime lab, he concluded, was mainly caused by inept leadership and a lack of financial support.

“Starved for resources,” the lab couldn’t offer competitive pay for its jobs. Less-than-qualified people tended to apply, and those who were hired discovered that money to educate them was scarce. The staff, as a result, was

“woefully undertrained,” and perhaps the most deficient among them was the man who hired Baldev Sharma, Ph.D.

James Bolding sometimes boasted of holding a doctorate, but the investigator found that he had none, nor any training in serology when, years earlier, he had come to work in the serology department. Within Bolding’s first year, his supervisor died, leaving Bolding in charge. Over the many years that Bolding remained in charge, the serology department became marked, according to Bromwich, by a “disregard for scientific integrity.” Analysts beneath Bolding often neglected to test evidence that was presented to them; the tests they did perform were “generally unreliable.” They misinterpreted, misrecorded, misreported the results. The investigator even found a case in which Bolding seemed to have committed “outright scientific fraud and perjury.”

And yet, as indifferent as he was to the mission of his unit, Bolding enjoyed supervising it and was apparently trying to enlarge his kingdom when, in the late 1980s, he requested permission to add to his section the capability of examining DNA. DNA analysis was then assuming importance in forensic-science circles around the country, but in Houston’s crime lab, only Bolding was interested. No one in the police department noticed anything awry with him, and no one objected to his plan, as long as he secured funding through grants.

Sharma was among the first DNA analysts Bolding employed, and you can imagine the sense of triumph that greeted Sharma’s arrival in 1989 and the air of authority as the highly educated man sat down to his work. Perhaps you can also imagine the surprise of his colleagues as Sharma began struggling with even the most basic functions of the job. Restriction fragment length

polymorphism seemed to baffle him; his bands were weak and diffuse. He could not even begin to perform polymerase chain reaction testing; he had never learned how. As Bromwich later discovered, Sharma was indeed highly educated, but he had the wrong education for the job” no experience in forensic science and only a basic theoretical knowledge of molecular biology.” The investigator could only conclude that Baldev Sharma was “technically incompetent.”

Another man might have sensed his shortcomings and quit, but Sharma seems to have been inoculated against feelings of inadequacy by his degree. And certainly, there was no one to fire him. Bolding “almost surely lacked the competence” to recognize problems in the DNA section, according to the investigator. Indeed, Bolding’s point of view was much like Sharma’s: any education is better than none. Thus, in 1993, when Bolding was elevated to oversee a larger portion of the lab, he chose Sharma to replace him as DNA director, unable to think of anyone more “appropriately credentialed.”

Those who would be directed by Sharma were less blind to his faults, however. Because of his advanced degree, Sharma had initially been hired as a senior DNA analyst; among more junior analysts, he had quickly developed a reputation, according to the investigator, for an inability to perform the tests. His willingness to ask others to do the tests for him was also well known, as was his comfort in supervising these people from his more advanced position.

Once Sharma was officially named supervisor, it became only more natural to ask less-educated subordinates to perform work that was beneath him. Sharma liked the job. No aspect pleased him more than being called to court, on which days he got to wear a suit. Sharma enjoyed wearing suits and could never

understand why members of his staff seemed not to enjoy testifying. He thought maybe they didn't like wearing suits.

Many expressed doubts to him, though, about the quality of their work. When one staff member remarked that the practice of transferring each case through numerous analysts might lead to the loss of information, "Dr. Sharma dismissed these concerns," Bromwich reported. Sharma merely informed his subordinate that the cases were transferred "according to the SOP." Some complained about standard operating procedures, but Sharma ultimately let them know that if it was SOP, it must be right.

He became a "widely disliked supervisor." His own superiors did not attempt to intervene until May 1995. Without any formal serology training himself, Sharma was training a new serologist when he "made a serious error." Trying to determine the presence of semen in a dried fluid stain, Sharma conducted no chemical test, as was SOP, but instead simply glanced through a microscope. No semen, he reported. Later, a fiber analyst noticed that the cloth had not been chemically tested and alerted Bolding, who had no choice but to order a new test. The results proved Sharma's conclusion to be utterly wrong—but only after the prosecutor had cut a deal with the accused based on the first result.

Bolding again had no choice but to lower Sharma's evaluation rating and to resume direct control of the DNA section. At least, this is what Bolding tried to do. Sharma, for his part, wouldn't stand for it. Soon after the promotion, Sharma had refused to recognize the authority of his less-educated boss and now resisted Bolding's attempts either to reprimand or supervise him. "Open and prolonged feuding" broke out between them, Bromwich reported. Donald Krueger, the "isolated and detached" director of the crime lab, stood by.

Another scandal was meanwhile growing within the DNA section, and eventually the media started quacking about a man who waited nine months in the Harris County jail before someone got around to testing his DNA. After the man was cleared, police chief Sam Nuchia ordered an investigation into how the DNA/serology section managed its cases, which internal audit found that there was little management oversight at all. Sharma, in short, was found incompetent, again, and it was just before this official conclusion was released that Krueger finally reached down, in August 1996, plucked Sharma out of DNA and put him in a new position.

Now, here's the most incredible part: After Sharma was ousted from the DNA section, after the police department's top brass undeniably knew how bad it was in there, everything got worse. The news cameras went away. Funding never improved And Krueger began to think that maybe the DNA/serology section didn't really need a direct supervisor.

Thus, as DNA analysis became all the rage in other crime labs around the country, the DNA/serology section in Houston rotted into a sort of Dickensian sweatshop: undertrained, unsupervised analysts generating their "mistake-ridden and poorly documented casework" as rain poured in through a leaky roof, the "bloody water dripping out of the boxes containing the evidence and pooling on the floor."

With only Bolding to look in on the section from time to time, the same problems that plagued the serology department now took over the analysis of DNA. Bromwich found that analysts examined only evidence associated with a known suspect. Of this evidence, they tended to report "only those results that, from their perspective, were 'safe' in the sense that they were consistent with

other evidence in the case or with the investigators' expectations." This was "accepted practice" within the section, Bromwich reported, and "when such selective reporting was coupled with the Crime Lab's systematic exaggeration of the statistical significance of [test] results," he went on, "a very significant risk of injustice was created."

Everything changed with the discovery of an actual injustice. In December 2002, reporters from KHOU began looking into the case of a man convicted of aggravated sexual assault. They discovered that a DNA analyst had both misinterpreted the results of her test and overstated their significance to a jury by about five orders of magnitude. As a result of their reports, Josiah Sutton was released after four years in prison, the DNA section was shut down and, ultimately, Bromwich was brought in.

The investigator seems to have been surprised when he arrived to find Baldev Sharma still on the premises. Krueger had named Sharma the lab's director of quality assurance/quality control, a decision that Bromwich had difficulty comprehending. "Because of Dr. Sharma's laziness and lack of professionalism, he was extremely unlikely to succeed in establishing an effective QA/QC program for the Crime Lab," the investigator wrote. Indeed, many Crime Lab employees reported seeing Sharma asleep on the job, "and they joked about videotaping him." In Bromwich's view, Sharma proved even less effective in quality control than he had been in the DNA/serology section. Even Sharma admitted that he only did about a year's worth of work in four-plus years on the job. And yet when Krueger demoted him from director of quality assurance, Sharma seems not to have understood. He appears to have thought job performance irrelevant, as long as you are a man of credentials.

From his new position as analyst of marijuana cases, Sharma felt justified in seeking a promotion. The job he sought was equivalent to Bolding's the supervisor of numerous departments. When it was given to a man with less education, Sharma told his wife the "department politics" were unbearable. Sometime in 2005, he decided to retire. This report is consistent with the findings in Bromwich (2005a), and the subsequent findings in Bromwich (2005b), which explains that (p. 17):

Dr. Sharma received a Ph.D. in Chemistry from Delhi University's All India Institute for Medical Sciences in 1966. Prior to joining the Crime Lab, Dr. Sharma had no experience in forensic science and only a basic theoretical knowledge of molecular biology. From November 26, 1989 through December 20, 1989, Mr. Bolding and Dr. Sharma attended the FBI Academy's Laboratory Application of DNA Typing Methods School, which covered RFLP analysis. Upon returning from the FBI Academy, Mr. Bolding and Dr. Sharma adopted the training manuals they had received from the FBI into the standard operating procedures ("SOPs") for the DNA Section. Earlier reports regarding Dr. Sharma also provide that (Olsen and Khanna, 2003):

Baldev Sharma, former DNA section supervisor and current head of quality control, has master's and Ph.D.-equivalent degrees in chemistry. Though his college transcripts are not in city files, an internal HPD memo said he had failed proficiency tests and therefore did not qualify for his position as quality-control supervisor.

He was suspended for five days in 1997 for mismanagement of the DNA section, but earned a promotion to quality control and was put in charge of getting the lab accredited. Regarding the incompetence and fraud of James

Bolding, it is further explained in Olsen and Khanna (2003): “The founder and former head of the DNA section, James Bolding, retired in June after the police chief recommended, he be fired. Bolding himself did not meet the standards for the job. Among other things, he failed both algebra and geometry in college, though he later passed both, and he never took statistics.” This is consistent with the characterization of Mr. Bolding in Bromwich (2005b) which provides that (p. 16):

James R. Bolding joined the Crime Lab in October 1979 and worked as a drug chemist for approximately 18 months. In the spring of 1981, the Crime Lab’s head serologist invited Mr. Bolding to train in serology in order to replace recent departures from the Lab. Mr. Bolding has described his serology training as consisting of less than five months of on-the-job training under the supervision of the head of serology. Within a year after Mr. Bolding began training in serology, his supervisor died. Mr. Bolding was the only remaining serologist in the Crime Lab. He had not yet received any formal training in fundamental serological techniques, including ABO blood typing. Mr. Bolding told us that he “took books home and did the best he could.” On November 14, 1981, Mr. Bolding was promoted to Criminalist II.

In July 1982, Mr. Bolding successfully completed an intensive course in bloodstain analysis at the Serological Research Institute (“SERI”) in Emeryville, California. That same month, and less than a year after his promotion to Criminalist II, Mr. McDonald recommended that Mr. Bolding be promoted to Criminalist III “as soon as possible” because he “is the only Criminalist II we have who is a qualified and experienced Forensic Serologist and he has recently completed the SERI course in Forensic Serology.” In the

fall of 1982, he was promoted to Criminalist III, despite his minimal experience in serology. Among the many lessons that can be learned from this narrow extrusion of the ongoing HPD Crime Lab scandal is one of forensic humility: research laboratory science and forensic laboratory science are not the same. Having a Ph.D. in chemistry or genetics or biology, taking an FBI short course in DNA, and believing oneself to be an expert—these are not sufficient forensic credentials to start working in, let alone running, a forensic lab. No matter how much experience one accumulates under such circumstances, and without the proper forensic education and outlook, the quality of that experience is necessarily substandard. Science has a very specific mandate, and forensic examiners are meant to satisfy a very particular role. Their participation in the justice system is often painful and thankless while also being vital to fairness. To do better than harm, forensic examiners must be objective, mitigate bias when necessary, employ the scientific method scrupulously, and engage in their practice with the utmost humility.

Summary Forensic criminologists are first and foremost scientific forensic examiners. They must therefore utilize the scientific method to not seek confirmation of their hypotheses, rather eradication. In their analysis and interpretation of related case evidence, forensic criminologists must keep several points of concern in mind. These are the federal rules of evidence; that the defense and prosecution have different rules; that every defendant is entitled to objective scientific expert assistance regardless of his or her circumstances; that as scientists they are not members of either adversarial “team”; that scientific fact and legal truth are not one in the same; that the



ultimate issue is for the trier of fact to decide, not the expert witness; and that no matter what, the judge is always right.

The HPD Crime Lab remains, as of this writing, one of the most scandal-ridden crime labs in the United States. This is in no small part owing to the fact that it suffered a second series of scandals and a second shutdown in early 2008, caused, again, by those brought in to fix the problems identified in the first.

To maintain objectivity and the resolve to conduct themselves impartially, it is crucially important that forensic criminologists also understand the issues of role strain, peer pressure, and cognitive dissonance, as well as metacognition and cognitive failure. Once these issues have been adequately acknowledged, they can be understood, addressed, and, one hopes, mitigated to some degree in each practitioner's work product.

CHAPTER THIRTEEN



THE CRIMINAL INVESTIGATOR (CRIME SCENE INVESTIGATION)

Arriving at the Scene: Initial Response/ Prioritization of Efforts

1. Initial Response/ Receipt of Information

Principle: One of the most important aspects of securing the crime scene is to preserve the scene with minimal contamination and disturbance of physical evidence. The initial response to an incident should be expeditious and methodical. Policy: The initial responding officer (s), upon arrival, shall assess the scene and treat the incident as a crime scene. They shall promptly, yet cautiously, approach and enter the crime scene, remaining observant of any persons, vehicles, events, potential evidence, and environmental conditions.

Procedure: The initial responding officer(s) should:

- a. Note or log dispatch information (e.g., address/location, time, date, type of call, parties involved).*
- b. Be aware of any persons or vehicles leaving the crime scene.*

c. Approach the scene cautiously, scan the entire area to thoroughly assess the scene, and note any possible secondary crime scenes.

d. Be aware of any persons and vehicles in the vicinity that may be related to the crime.

e. Make initial observations (look, listen, smell) to assess the scene and ensure officer safety before proceeding.

f. Remain alert and attentive. Assume the crime is ongoing until determined to be otherwise.

g. Treat the location as a crime scene until assessed and determined to be otherwise.

h. Safely direct additional responding units into the area.

Summary: It is important for the initial responding officer(s) to be observant when approaching, entering, and exiting a crime scene.

2. Safety Procedures

Principle: The safety and physical well-being of officers and other individuals, in and around the crime scene, are the initial responding officer(s)' first priority. Policy: The initial responding officer(s) arriving at the scene shall identify and control any dangerous situations or persons. Procedure: The initial responding officer(s) should:

a. Ensure that there is no immediate threat to other responders; scan area for sights, sounds, and smells that may present danger to personnel (e.g., hazardous materials such as gasoline, natural gas). If the situation involves a clandestine drug laboratory, biological weapons, or radiological or chemical

threats the appropriate personnel/agency should be contacted prior to entering the scene.

b. Approach the scene in a manner designed to reduce risk of harm to officer(s) while maximizing the safety of victims, witnesses, and others in the area.

c. Survey the scene for dangerous persons and control the situation.

d. Notify supervisory personnel and call for assistance/backup. Summary: The control of physical threats will ensure the safety of officers and others present.

3. Emergency Care

Principle: After controlling any dangerous situations or persons, the initial responding officer(s') next responsibility is to ensure that medical attention is provided to injured persons while minimizing contamination of the scene.

Policy: The initial responding officer(s) shall ensure that medical attention is provided with minimal contamination of the scene. Procedure: The initial responding officer(s) should:

a. Assess the victim(s) for signs of life and medical needs and provide immediate medical attention.

b. Call for medical personnel.

c. Guide medical personnel to the victim to minimize contamination/alteration of the crime scene.

d. Point out potential physical evidence to medical personnel, instruct them to minimize contact with such evidence (e.g., ensure that medical personnel preserve all clothing and personal effects without cutting through bullet holes, knife tears), and document movement of persons or items by medical personnel.

e. Instruct medical personnel not to “clean up” the scene and to avoid removal or alteration of items originating from the scene.

f. If medical personnel arrived first, obtain the name, unit, and telephone number of attending personnel, and the name and location of the medical facility where the victim is to be taken.

g. If there is a chance the victim may die, attempt to obtain “dying declaration.” In some instances, fingerprint and shoe impressions of medical personnel may need to be taken for elimination purposes.

h. Document any statements/comments made by victims, suspects, or witnesses at the scene.

i. If the victim or suspect is transported to a medical facility, send a law enforcement official with the victim or suspect to document any comments made and preserve evidence. (If no officers are available to accompany the victim/suspect, stay at the scene and request medical personnel to preserve evidence and document any comments made by the victim or suspect.)

Summary: Assisting, guiding, and instructing medical personnel during the care and removal of injured persons will diminish the risk of contamination and loss of evidence. Safeguard evidence, such as a weapon, that is taken into custody. Follow chain-of-custody procedures as soon as the evidence is confiscated.

4. Secure and Control Persons at the Scene

Principle: Controlling, identifying and removing persons at the crime scene, and limiting the number of persons who enter the crime scene and the movement of such persons is an important function of the initial responding officer(s) in protecting the crime scene. Policy: The initial responding officer(s)

shall identify persons at the crime scene and control their movement.

Procedure: The initial responding officer(s) should:

a. Control all individuals at the scene—prevent individuals from altering/destroying physical evidence by restricting movement, location and activity while ensuring and maintaining safety at the scene.

b. Identify all individuals at the scene, such as:

- *Suspects: Secure and separate.*
- *Witnesses: Secure and separate.*
- *Bystanders: Determine whether witness, if so treat as above; if not, remove from the scene.*
- *Victims/family/friends: Control while showing compassion.*
- *Law Enforcement, Medical and other assisting personnel.*

c. Exclude unauthorized and nonessential personnel from the scene (e.g., law enforcement officials not working the case, politicians, media).

Summary: Controlling the movement of persons at the crime scene and limiting the number of persons who enter the crime scene is essential to maintaining scene integrity, safeguarding evidence and minimizing contamination.

5. Boundaries: Identify, Establish, Protect and Secure

Principle: Defining and controlling boundaries provide a means for protecting and securing the crime scene(s). The number of crime scenes and their boundaries are determined by their location(s) and the type of crime. Boundaries are established beyond the initial scope of the crime scene(s) with the understanding that the boundaries can be reduced in size if necessary but

cannot be as easily expanded. Policy: The initial responding officer(s) at the scene shall conduct an initial assessment of the extent of the crime scene(s) and then establish and control its boundaries. Procedure: The initial responding officer(s) should:

- a. Establish boundaries of the scene(s), starting at the focal point and extending outward to include:*
 - *Where the crime occurred.*
 - *Potential points and paths of exit and entry of suspects and witnesses.*
 - *Places where the victim/evidence may have been moved (be aware of trace and impression evidence while assessing the scene).*
- b. Secure the scene. Set up physical barriers (e.g., ropes, cones, crime scene barrier tape, available vehicles, personnel, other equipment) or use existing boundaries (e.g., doors, walls, gates).*
- c. Document the entry/exit of all people entering and leaving the scene, once boundaries have been established.*
- d. Protect the scene. Control the flow of personnel and animals entering and leaving the scene to maintain integrity of the scene.*
- e. Institute measures to preserve/protect evidence that may be lost or compromised (e.g., protect from the elements (rain, snow, wind) and from footsteps, tire tracks, sprinklers).*
- f. Document the original location of the victim or any objects that you observe being moved.*
- g. Consider search and seizure issues to determine the necessity of obtaining consent to search and/or obtaining a search warrant. Note: Persons should NOT smoke, chew tobacco, use the telephone or bathroom, eat or drink, move*

any items from the scene including weapons (unless necessary for the safety and well-being of persons at the scene), adjust the thermostat or open windows or doors (maintain scene as found), touch anything unnecessarily (note and document any items moved), reposition moved items, litter, or spit within the established boundaries of the scene.

Summary: Establishing boundaries is a critical aspect in controlling the integrity of evidentiary material. Do not allow suspect to use bathroom facilities, or to alter his/her appearance, including brushing hair or washing hands.

6. Turn over Control of the Scene and Brief Investigator(s) in Charge

Principle: Briefing the investigator(s) taking charge assists in controlling the crime scene, helps establish further investigative responsibilities and assists with the managing of resources. Policy: The initial responding officer(s) at the scene shall provide a detailed crime scene briefing to the investigator(s) in charge of the scene. Procedure: The initial responding officer(s) should:

- a. Brief the investigator(s) taking charge.*
- b. Assist in controlling the scene.*
- c. Turn over responsibility for the documentation of entry/exit.*
- d. Remain at the scene until relieved of duty.*

Summary: The scene briefing is the only opportunity for the next in command to obtain initial aspects of the crime scene prior to subsequent investigation.

7. Document Actions and Observations.

Principle: All activities conducted and observations made at the crime scene must be documented as soon as possible after the event to preserve information.

Policy: The initial responding officer(s) shall maintain documentation as a permanent record. Procedure: The initial responding officer(s) should document:

a. Observations of the crime scene, including the location of persons and items within the crime scene and the appearance and condition of the scene upon arrival.

b. Conditions upon arrival (e.g., lights on/off; shades up/down, open/closed; doors and windows open/closed; smells; ice, liquids; movable furniture; weather; temperature; and personal items.)

c. Personal information from witnesses, victims, suspects and any statements or comments made.

d. Their own actions and actions of others.

Summary: The initial responding officer(s) at the crime scene must produce clear, concise, documented information encompassing his or her observations and actions. This documentation is vital in providing information to substantiate investigative considerations.

8. Establish a Command Post (Incident Command System) and Make Notifications

Principle: Setting up a location where crime scene investigation activities can be coordinated, media meetings can be held, and team meetings can occur is very valuable. This command post provides a central location for crime scene investigation activities and assessment of resources. The activities also relate to ensuring that other key investigative participants are told of the investigation and included in activities as needed. Policy: The investigator(s) in charge shall set up a location where crime scene investigation activities can be coordinated, media meetings can be held, and team meetings can occur. Procedure: The investigator(s) in charge should:

- a. Set up a temporary command post in a location where media can take necessary photographs without jeopardizing the scene (and evidence) security.*
- b. Notify investigators or appropriate department(s) (such as Homicide) of information gathered at the crime scene. Discuss details of the scene during this step.*
- c. Notify Communications Department (Dispatch) of phone numbers at the command post.*
- d. Ask Communications Department (Dispatch) to notify surrounding agencies and send teletypes regionally and nationally when a suspect has fled the scene. These alerts should include a description of the suspect, vehicles involved and contact information for the person these agencies should contact if they locate the suspect.*
- e. Brief the supervisor as required.*

- f. Verify that a command post is established. If not, make the necessary arrangements to correct the situation.*
- g. Debrief with first responder and officer(s)/investigator(s).*
- h. Make necessary assignments, recording each on a formal assignment sheet.*
- i. Use assignment sheet to record assignment updates throughout the investigation. Make this assignment sheet available to personnel working on the case. Assign evidence recorder, entry/exit recorder (who is also responsible for keeping event timetable).*
- j. Ensure that the Communications Department is aware of important contact phone numbers including the command post.*
- k. Establish the status and locations of victims and suspects.*
- l. Establish the status of bulletins that have been broadcast regarding victims and suspects. Ensure that missing suspect alerts are broadcast. Establish a schedule for investigative team meetings (including all uniformed officers), during which status will be given, assignment updates will be made, and other key information will be shared.*

Summary: The establishment of a command post is critical to the communication among the crime scene responders, Dispatch and others providing information to the crime scene responders.

9. Manage Witnesses

Principle: The timely interviewing of witnesses is crucial to the solution of a crime. Witnesses to crimes must be identified, secured, questioned at the scene, if applicable, and processed according to departmental regulations. Policy: The investigator(s) in charge shall identify and secure witnesses to crimes,

interview them at the scene, if applicable, and process them according to departmental regulations. Procedure: The investigator(s) in charge should:

a. Interview any witnesses at the scene separately to best use their reported experiences to benefit the overall investigation. Obtain written/recorded statements from each witness at the police station.

b. Transport each witness to the police station separately from other witnesses or suspects.

c. When possible, the following tasks should be performed by the Supervising Officer:

- Establish the status and locations of each victim and suspect.
- Establish the status of bulletins that have been broadcast regarding each victim and suspect. Ensure that any necessary missing suspect alert is broadcast in a timely manner.

Summary: The timely separate interviewing of witnesses is important to obtain information about any crime.

PRELIMINARY DOCUMENTATION AND EVALUATION OF THE SCENE

1. Conduct Scene Assessment

Principle: Assessment of the scene by the investigator(s) in charge allows for the determination of the type of incident to be investigated and the level of investigation to be conducted. Policy: The investigator(s) in charge shall identify specific responsibilities, share preliminary information, and develop

investigative plans in accordance with departmental policy and local, State, and Federal laws. Procedure: The investigator(s) in charge should:

- a. Converse with the first responder(s) regarding observations/activities.*
- b. Evaluate safety issues that may affect all personnel entering the scene(s) (e.g., blood - borne pathogens, hazards).*
- c. Evaluate search and seizure issues to determine the necessity of obtaining consent to search and/or obtain a search warrant.*
- d. Evaluate and establish a path of entry/exit to the scene to be utilized by authorized personnel.*
- e. Evaluate initial scene boundaries.*
- f. Determine the number/size of scene(s) and prioritize.*
- g. Establish a secure area within close proximity to the scene(s) for the purpose of consultation and equipment staging.*
- h. If multiple scenes exist, establish and maintain communication with personnel at those locations.*
- i. Establish a secure area for temporary evidence storage in accordance with rules of evidence/ chain of custody.*
- j. Determine and request additional investigative resources as required (e.g., personnel/specialized units, legal consultation/ prosecutors, equipment).*
- k. Ensure continued scene integrity (e.g., document entry/exit of authorized personnel, prevent unauthorized access to the scene).*
- l. Ensure that witnesses to the incident are identified and separated (e.g., obtain valid ID).*
- m. Ensure the surrounding area is canvassed and the results are documented.*
- n. Ensure preliminary documentation /photography of the scene,*

injured persons and vehicles. Summary: Scene assessment allows for the development of a plan for the coordinated identification, collection, and preservation of physical evidence and identification of witnesses. It also allows for the exchange of information among law enforcement personnel and the development of investigative strategies.

2. Conduct Scene “Walk-Through” and Initial Documentation

Principle: The scene “walk - through” provides an overview of the entire scene, identifies any threats to scene integrity, and ensures protection of physical evidence. Written and photographic documentation provides a permanent record. A “walk-through” should only be completed if there will be no disturbing of evidence. There may be the need for the immediate documentation and collection of evidence prior to the walk through. Policy: The investigator(s) in charge shall conduct a walk-through of the scene. The walk-through shall be conducted with individuals responsible for processing the scene. Procedure: During the scene walk-through, the investigator(s) in charge

should:

- a. Avoid contaminating the scene by using the established path of entry.*
- b. Consider whether personal protective equipment (PPE) should be used.*
- c. Prepare preliminary documentation (e.g. notes, rough sketches) of the scene as observed.*



d. Identify and protect fragile and/or perishable evidence (e.g., consider climatic conditions, crowds/hostile environment). Ensure that all evidence that may be compromised is immediately documented, photographed and collected.

e. When involved in the initial walkthrough, note the condition of the scene. Record relevant observations, which may include things such as:

- Ceilings*
- Doors, including entry and exit points: Are they open, closed, locked or forced open? On which side was the key?*
- Windows: Are they open or closed? Is there broken glass? Were they locked or forced open?*
- Lights: On or off? If left on, which lights were on?*
- Shades or shutters: Open or closed?*
- Floors/Rugs*
- Interior lighting conditions*
- Odors: Cigarette smoke, gas, powder, perfume, etc.*
- Description of perpetrator (when present)*
- Description of crime-related people present*
- Description of emergency medical or search-and-rescue personnel present*
- Weapons observed*
- Furniture present, including location relative to victim, as applicable and overall scene*
- Signs of activity: Meal preparation, dishes in sink, condition of housekeeping (clean, dirty or items in disarray), appliances left on, television/stereo left on (note the channel), etc.*
- Date and time indicators: Mail, newspapers, dates on milk cartons, stopped clocks, spoiled foods, items that should have been hot or cold, but are at room temperature*
- Temperature of the room and environmental conditions*

f. Develop a general theory of the crime Summary: Conducting a scene walk-through provides the investigator(s) in charge with an overview of the entire scene. The walk-through provides the first opportunity to identify valuable and/or fragile evidence and determine initial investigative procedures,

providing for a systematic examination and documentation of the scene. Written and photographic documentation records the condition of the scene as first observed, providing a permanent record.

3. Note-Taking and Logs

Principle: Note-taking and logs provide a permanent record of crime scene activities. Policy: All personnel assigned to the crime scene investigation shall maintain notes and logs of their activities. Procedure: Detailed entry/exit logs should be created. An entry/exit log is used to document the people who come to and go from a crime scene during the investigation. People who were at the crime scene before the investigation began are also noted in this log. a. The officer monitoring the log, the “Log Officer,” is assigned the task by the Supervising Officer and is responsible for completing this task and monitoring the log at all times. The Log Officer is responsible for ensuring that the log is filled out thoroughly and anyone entering the scene has a stated purpose there. b. Position the log so that it is clearly visible. Set up the log for people to use when arriving to and departing from the scene. Record the following information about the crime scene:

- Crime scene location
- Name of witnesses
- Name of victims
- Name of persons taken into custody
- Name of first responders and approximate arrival times

- Name of Supervising Officer and approximate arrival time (approximate time should be used if arrival time was before the log was established)

c. Record the information below for each person at the scene. If not using an official log book or forms, leave spaces where this information can be recorded:

- Arrival date
 - Time of arrival
 - Name
 - Identification and Unit numbers
 - Organization (if not with the investigating department)
 - Reason for being at the scene Log information should include:
 - The arrival and departure times of all personnel at the crime scene, including the Coroner or Medical Examiner, crime scene technicians, and State's Attorney.
 - Information about: who is at the crime scene and why they are there; incident number; first responder names, Log Officer and Supervising Officer names, shield numbers, Unit numbers; location of crime scene; name of victim(s)
 - Before making it available to crime scene visitors, record logistical data (time, crime scene location, names of victims and witnesses, etc.) in the entry/exit log.
- Ensure that the departure time for any person departing from the scene is recorded prior to that person actually leaving. If someone exits the scene without reporting to the Log Officer, that officer can enter an estimated departure time along with a note stating the rationale for it being estimated. Store the log in a secure location and as mandated by departmental regulations.

PROCESSING THE SCENE

1. Determine Team Composition

Principle: It is essential to a successful investigation to select a team of trained personnel to perform scene processing, based on the type of incident and complexity of the scene. Policy: The investigator(s) in charge shall assess the scene to determine team composition and specialized resources required.

Procedure: Following the walk-through, the investigator(s) in charge should: a. Assess the need for additional personnel. They should be aware of the need for additional personnel in cases involving multiple scenes, multiple victims, numerous witnesses or unique circumstances.

b. Assess forensic needs and call forensic specialists to the scene for expertise and/or equipment.

c. Ensure that scene security and the entry/exit documentation are continued.

d. Select qualified person(s) to perform specialized tasks (e.g., photography, sketch, latent prints, evidence collection).

e. Document team members and assignments. Summary: The assessment of the scene(s) determines the number of personnel and how responsibilities will be assigned.

2. Ensure Contamination Control

Principle: Contamination control and preventing cross - contamination at single or multiple scenes is essential to maintaining the safety of personnel and the integrity of evidence. Policy: The investigator(s) in charge shall require all

personnel to follow procedures to ensure scene safety and evidence integrity.

Procedure: Other responders and/or team members should:

- a. Limit scene access to people directly involved in scene processing.
- b. Follow established entry/exit routes at the scene.
- c. Identify first responders and consider collection of elimination samples.
- d. Designate a secure area for trash and equipment.
- e. Use personal protective equipment (PPE) to prevent contamination of personnel and minimize scene contamination.
- f. Clean/sanitize or dispose of tools/equipment and personal protective equipment between each item of evidence collection and/or scenes.
- g. Utilize single - use equipment when performing direct collection of biological samples.

Summary: Minimize contamination by being safe, clean and careful to ensure the welfare of personnel and the integrity of the evidence.

3. Documentation

Principle: An assessment of the scene determines what kind of documentation is needed (e.g., photography, video, sketches, measurements, notes). Policy:

The investigator(s) in charge shall ensure documentation of the scene.

Procedure: The team member(s) should:

- a. Review the assessment of the scene to determine the type of documentation needed.
- b. Coordinate photographs, video, sketches, measurements and notes.
- c. Photograph. This involves scene utilizing overall, medium, and close-up coverage. Evidence to be collected with and without measurement scale and/or

evidence identifiers Victims, suspect's witnesses, crowd and vehicles, Additional perspectives, (e.g., aerial photographs, witness's view, area under body once body is removed).

d. Record video as an optional supplement to photographs

e. Prepare preliminary sketch (es) and measure: This involves immediate area of the scene, noting case identifiers and indicating on the sketch, Relative location of items of evidence, correlating evidence items with evidence records, Evidence prior to movement, Rooms, furniture or other objects, Distance to adjacent buildings or other landmarks.

f. Generate notes at the scene:

This involves Document location of the scene, time of arrival and time of departure, Describe the scene as it appears, Record transient evidence (e.g., smells, sounds, sights) and conditions (e.g., temperature, weather)

Document circumstances that require departure from usual procedures

Sketching Equipment Needed

- Graph paper
- Paper
- 50- to 100-foot retractable measuring tape
- 1000-foot walking wheel
- Folding rule
- Ruler
- Oversize clipboard with storage pocket



- Eraser
- Magnetic compass
- Personal protective equipment (when needed)
- Flashlight
- Notebook
- Pencil The accuracy of all measuring devices should be ensured by comparison to a measure of certified accuracy, such as a NIST traceable ruler.

General Considerations

- A sketch of a crime scene is required when spatial relationships or proportional measurements are needed. Use spatial relationships to relate evidence to other objects. Use proportional measurements to calculate such things as bullet trajectory angles or to reconstruct accident details.
- The rough sketch is the first sketch drawn at the scene; multiple rough sketches may be required depending on the crime. The sketch includes a scene outline with the location of objects and evidence clearly marked. A finished sketch is derived from the rough sketch.
- Draw the rough sketch before anything is moved or destroyed, and after photographs are taken. Do not alter the scene.
- Depending on the crime, draw one or all of these types of sketches: a sketch showing the surrounding areas, a sketch showing only measurements, and a sketch showing locations of objects, such as the locations of evidence, victim(s), etc.
- Measurements should be accurate to within ¼”.

- Include, outside of the drawn crime scene, measurements for dimensions of rooms, furniture, doors and windows, and distances between objects, entrances and exits, bodies and persons. Draw details, such as object size, proportionally in a rough sketch.
- Take measurements from fixed location reference point, such as walls or curbs, or from stationary appliances.
- Include as much information as possible in the sketch: streets, plants, entry and exit points, location of bullets and cartridges, etc.
- Do not alter a rough sketch after leaving the crime scene. If changes are required of the rough sketch, photocopy the original rough sketch to preserve its integrity.
- Newer technology makes use of laser scanning devices to perform crime scene sketching. The employment of these devices should be reserved to investigators trained in their use. Information that should be documented
 - Record the time, date, name of the person who contacted the authorities, and incident information as soon as notification of a crime is received. These notes should be kept separate from the sketch.
 - Initial notes about the incident should answer the who, what, when, where, why and how questions.
 - Incident information includes: who reported the incident, when the incident was first reported, the crime scene location, a description of incident and participant names.
 - Gather information to use when sketching by talking to others at the scene. Record that information in the notes.



- Questions that can provide valuable information include:

How did the victim or suspect arrive at or leave from the scene? – How was the crime committed? Which items were handled? – Which items were moved? – Which items are broken or stained?

- Have potentially flammable vapors been detected at the scene? (When potentially flammable conditions exist, take appropriate precautions.)

- While sketching the scene, record related information in the notes. It is critical to use a systematic approach to note-taking while sketching to maintain a record of your activities and the order of sketches made.

- Specify the changes made to a scene prior to sketching, such as when objects were moved or placards added. Note who made the changes and why they occurred. **Determining the Scale** Determine the scale to use for all sketches. The usual scale for outdoor scenes is one inch equals twenty feet. The usual scale for indoor scenes is one-eighth inch equals one foot. Select which standard units of measurement will be used: metric (meters, centimeters) or English (feet, inches). An important consideration when determining the scale is fitting the scene to the sketch paper. To calculate the scale:

1. Determine the longest measurement at the scene.
2. Divide this measurement by the longest measurement of the sketch paper. The resulting number establishes the largest measurement end of the scale.
3. Often graph paper is used for scale drawings. When using graph paper, assign a specific number of squares to the measurement identified in Step 2.

- Use this method to establish other measurements by substituting the actual measurement in place of the longest measurement in Step 1.

Create a title block on the graph paper being used for the sketch in the lower right corner of the paper. The title block typically includes:

- Case number
- Crime type
- Victim name
- Name and ID# of sketcher
- Name and ID# of person verifying measurements
- Location of sketch
- Date completed

Create a legend for the sketch on the graph paper used for the sketch. Each sketch must include a legend that is specific to it. A legend identifies:

- North-facing direction (usually points to top of page)
- Identification symbols used for information in sketch
- Sketch ID#
- Scale used

An accepted practice for assigning identification symbols is:

- Use compass points to identify walls.
- Use evidence numbers assigned to objects to identify them in the sketch.

The legend will be updated after drawing the sketch to ensure accuracy and completeness, and to include:

- Measurements for dimensions of rooms, furniture, doors and windows
 - Distances between objects, entrances and exits, bodies and persons
- Categories of sketches. There are four categories of sketches:

Perspective – A perspective sketch contains a vanishing point and depicts objects of evidence as they would appear to the eye with reference to relative distance and depth.

Projection – A projection sketch usually contains only one viewpoint and depicts objects on one plane. The overview sketch (of the horizontal plane) is the most common type of sketch and is usually done from a bird’s eye view; it shows the floor plan. Less common is the elevation sketch (of the vertical plane), which shows a side view typically of landscapes or buildings.

One extrapolation of the projection sketch is the “Exploded” view sketch that contains more than one wall from one viewpoint. It combines the overview and elevation sketches. Schematic – The schematic sketch is used when it is desirable to represent a sequence of events such as following the trajectory of a bullet through a crime scene location. Detailed – The detailed sketch is used when describing a small area that is not easily incorporated into the overall drawing due to the scale chosen for the rough or finished scale drawing. This is especially useful for large crime scenes.

Creating a Projection Sketch

1. Determine the view to be shown in the sketch: overhead or exploded. – The overhead view shows a floor plan. This is the most frequently used view in sketches. – The exploded view shows a floor plan with walls laid out flat. Objects on the floor and on walls, such as bullet holes or bloodstains, are shown in their relative positions in the exploded view sketch.

2. Draw an outline that is to scale of the area of interest, including locations of approaches and accurate measurements of the perimeter. The size of the outline should fill as much of the paper as possible.
3. Draw the rough sketch before anything is moved or destroyed, and after photographs are taken. Do not alter the scene. Show locations of windows and doors. Use a curved line to indicate the direction that each door opens.
4. Use only the selected units of measurement. The sketch or accompanying notes should indicate where a measurement of an object was taken (e.g., middle of the object, near- corner, far-corner, etc.). Measurements of bloodstains are often done on a metric scale (e.g., millimeters).
5. Whenever possible, have another officer or crime scene investigator observe measurements for confirmation purposes.

Measurements

Rectangular coordinate method of measurement Polar Coordinate Method, The polar coordinate method is more appropriate for an outdoor scene in which only a single fixed or reference point is present. Measure both the distance and direction (angle) an object is from a known reference point. The angle can be measured with either a large protractor or an optical device such as a transit or a compass. The protractor technique with a 360- degree protractor is useful for underwater scenes. Transecting Baseline Coordinate Method – The transecting baseline coordinate method is used to measure items of evidence when there are numerous objects in the crime scene and other measuring techniques will not work. This is accomplished by laying a tape measure down so that it crosses the entire room or area to be measured. This first tape measure becomes

the baseline for all other measurements in the crime scene. Measurements are then made perpendicularly from this tape by laying another tape measure at a 90-degree angle to the first tape and measuring out to the evidence.

Transecting baseline coordinate method of measurement

- Take accurate measurements of the exact locations and relative positions of evidence using the triangulation method when there are at least two fixed points within the outlined area.
- Use triangulation indoors or outdoors; it is an especially good method to use in areas lacking straight lines.
- Take measurements from fixed locations, such as a wall or curb, or from a stationary appliance. Identify these locations in your legend.
- Measurements should be accurate to within $\frac{1}{4}$ inch.
- Include height measurements to show how far off of the ground an object was found.
- When determining distance based on triangulation: a) Select two fixed points within the outlined area, such as walls, curbs, or street signs. b) Draw a baseline between the two fixed points. c) Select another object within the outlined area. d) Measure the distance to that object from each of the baseline's fixed end points, creating a triangle.
- Use a measuring tool to ensure accurate measurements are taken.
- Take accurate measurements of the exact location and relative position of evidence using rectangular coordinates and the baseline method when: there are two known points or accurate measurements are needed for an

object located on or perpendicular to the line between those two points (the baseline).

- Use the baseline method in outdoor areas that are irregularly shaped and where no natural baseline is present. This method is useful in situations such as scenes that occur in the desert or on farmland.
- Take measurements from fixed locations, such as a lamp post or curb, or from a stationary appliance.
- Measurements should be accurate to within $\frac{1}{4}$ inch.
- Include height measurements to show how far off of the ground an object was found.

When determining distance based on the transecting baseline coordinate method:

- a) Select two fixed points within (at the outer edges of) the outlined area, such as a kitchen appliance, a door, a window, a corner or wall (a wall is preferred).*
- b) Create the baseline by drawing a line between the two selected fixed points.*
- c) Measure the length of the baseline.*
- d) Select an object within the outlined area.*
- e) When the object is on the baseline, measure from one of the fixed end-points to the object.*
- f) When the object is not on the baseline, draw a straight line from the object at a 90-degree angle to the baseline.*
- g) Measure the length of the line drawn.*
- h) Measure from one of the fixed end-points to the point where the new line meets the baseline.*



- When a sketch is complete, prominently write “Not to Scale” outside of the sketch, then update related documentation, such as the legend and notes. Note: Although accurate measurements were taken, potential courtroom controversies related to those measurements may be avoided by placing the “Not to Scale” disclaimer on the rough sketch.
- Ensure that all identification symbols used on the sketch are included and defined on the legend.
- Include descriptive details related to the sketch in notes such as lighting conditions, names of people in the area, colors of objects, odors, weather.
- Include updates such as distances between objects and dimensions of rooms, windows, doors, etc.
- Until all rough sketches for a crime scene are complete, repeat the previous steps.
- Do not update any rough sketch after leaving the scene.
- Finish note-taking at the scene. Include the time that sketching was completed in the notes. Note-taking should occur throughout the sketching activities.
- Finished sketches can be completed either by the originator of the rough sketches or by another staff member, such as a draftsman or artist.

PHOTOGRAPHY

Common crime scene investigation photography is an important part of the documentation of a crime scene. Photographs are typically taken based upon the perspective of the camera to the target.

a. Overall

b. Midrange

c. Close-up Note: Equipment Needed

- Personal protective equipment
- Camera: 35mm and/or digital single-lens reflex (SLR) of 12 megapixels or greater recommended (a backup camera is also advisable)
- Several rolls of color film and black-and-white film, if using film camera
- Battery backups
- Memory cards for digital cameras. Detachable flash or additional lighting
- Flashlight
- Tripod
- Camera cleaning supplies
- Pen • Notebook
- Evidence placards
- Rulers

General Considerations

Always use the designated safe route when moving through the scene. Avoid disturbing the scene.



- When it is necessary to alter the scene, such as by placing placards or disassembling equipment, always take photographs of the scene before and after alteration, and with scale when appropriate.
- When using a digital camera, never delete a photograph from camera or digital media memory. When using film, never discard used film or negatives.
- Use a sturdy tripod with a cable release or the camera timer feature when placing the camera 90 degrees to the subject, such as when taking fingerprint/footprint/shoeprint/tire track photos.
- Take interior photographs using a vertical orientation to get the full length of a wall in a photograph.
- Take a complete set of pictures, including overall (long-range), midrange and close-ups.
- Remove the film or download the digital images and store in a secure location according to departmental regulations when photography is completed.

Preliminary Steps

1. Upon arrival at the scene, record names and arrival times (when known) of all personnel involved, including investigators, medics, first responders, etc.
2. When applicable, include the names of those assigned to specific tasks in either the photo log or, when using a photo list, a notebook.
3. Plan the photography route. Photograph transient objects, such as bloodstains or latent prints, as soon as possible. Move from the exterior to the interior of the crime scene, and from general to specific focus.

4. The photography session should occur in an uninterrupted, systematic, focused manner.

When planning the route, ask:

- How did the victim or suspect arrive at or leave from the scene?
- How was the crime committed?
- Which items were handled?
- Which items were moved?
- Which items are broken or stained?
- Have potentially flammable vapors been detected at the scene?

Caution: Some photographic and flash equipment is flammable. When potentially flammable conditions exist, appropriate precautions must be taken.

Note: Do not go beyond boundary markers to take photographs unless absolutely necessary.

Plan and prepare lighting for each scene and camera angle.

The following techniques are commonly employed:

a) Front lighting places the camera, lens, and flash or light source, directly in front of the object to be photographed. It is often the most appropriate type of lighting to use at crime scenes.

b) Side or oblique lighting places the camera directly in front of the object while the flash or light source is placed to the side of the object to be photographed. This can range from 45 to 90 degrees depending on the subject



and the shadow detail observed. Oblique lighting produces the best results for three-dimensional (3D) objects and is recommended for the following:

- To show details such as tool marks, surface irregularities or textures
- To show vehicle accident damage
- When photographing in closets or other small spaces
- When photographing polished surfaces

Control the use of lighting by manually changing the aperture, shutter speed settings and turning on/off flash settings. It is important to have a detachable flash, or, if the flash is not detachable, another light source. Film Photography Most agencies no longer use film for crime scene photography. If film is used, consider the following guidelines:

- Plan the type of film to be used for a series of photographs when anticipating taking midrange then close-up photographs immediately after overall photographs.
- If it is anticipated that a change of film will be necessary, change the film before taking the overall photographs.
- Black-and-white film: Use black-and-white film for close-up photographs of fingerprint/footprint/shoeprint/tire track evidence.
- Color film: Use color film for close-up photographs of bloodstains and other bodily fluids. Overall Photographs
- Take overall photographs of the area surrounding the scene from its perimeter, from multiple locations and angles. Include exteriors of buildings, cars, both sides of entries and exits, and bystanders.

Guide lines for overall photographs:

- Encompass the entire large scene and be overlapping
- Represent a 360-degree perspective and include a landmark
- Include identifying marks, such as house number(s) or license plate(s)
- Overall photos may also encompass smaller “sub-scenes” that exist within the larger scene. For indoor scenes, consider photography from each corner of a room, looking into the room.
- After the scene is photographed as found, additional photographs with placards, used as evidence identifiers, must be wholly visible in overall photographs when they are used, such as when midrange and close-ups will be taken of the scene. They must be placed in close proximity to the subject(s) of the photograph.
- While taking photographs of a scene, record related information in notes.
- It is critical to use a systematic approach to note-taking while taking photographs to maintain a record of your activities and the order and location of pictures as they are taken.
- Specify the changes you made to a scene while taking photographs, such as when a light was turned on or objects were moved.
- Note-taking should occur throughout the photography session. Finish note-taking at the scene. Include the time that photographing began and was completed in the notes.

Midrange Photographs

- Take midrange photographs before and after placing placards or rulers. It is important to take photographs that establish the relationships of objects or reference points in the scene.
- Take close-up photographs immediately after taking the midrange photograph, when appropriate.
- It may be appropriate to follow midrange photographs of a scene with close-up pictures of the same scene when showing a scene before, during, and after placard/ruler placements, near- views of human injuries or vehicle accident damage.
- While taking photographs of a scene, record related information in notes.
- Take photographs of transient evidence from a position that:
 - Shows the spatter relative to other objects in the area
 - Is perpendicular to the spatter
- Take pictures of the scene before and after placing the placards and rulers, and after removing the placards and rulers. Photographing the Deceased Before the body of a deceased person is moved, it should be photographed. The following guidelines should be followed:
 - Take photographs from all possible angles. Show a facial view, and the positions of the hands and feet when possible to do so without altering the body, its clothing or position. Wound photography should be conducted at close-up range.

- Take photographs while moving around the body and from an overhead perspective. Photograph the body from two perspectives, when possible:
 - a) As though looking at the body from a standing position
 - b) From the same level as the body is lying, such as at ground level when the body is lying on the ground
- Use oblique lighting to show wounds on the body, such as bite marks, with and without a scale.
- After the deceased has been removed from the scene, photograph the area where the body was.
- Signs of activity can include:
 - TV and room lights turned on
 - A glass holding a cold beverage (ice melting or still frozen) and a plate with fresh food on it
 - Scattered clothing, magazines, or other objects
 - A landline phone that was in use and is making a loud notification sound
 - Misplaced furniture, as with a tipped stool beside a body
 - Cigarettes, lit or remains piled in ashtray
 - Tool marks in unusual location or near entry/exit
 - Shoeprints and/or fingerprints
 - Drug paraphernalia
- Include the time that photographing was begun and completed in the notes.
- Remove the film or download the digital images and store in a secure location according to departmental regulations. Close-up Photographs



□ Photograph fingerprint/footprint/shoeprint/tire track evidence using black-and-white film (when using film). Carefully place the ruler and camera perpendicular to each other and relative to the impression.

□ When the photograph needs to be accurately scaled:

- The ruler must be on the same plane as the impression.
- The camera lens must be perpendicular (90 degrees) to the subject.
- Use a level and tripod to position the camera accurately. □ Take multiple shots with the light or flash at different angles, such as 0 degrees, 15 degrees, 45 degrees, etc., to achieve the best possible photographs. Taking Photos of Impression Evidence
Tire Impressions: For tire impressions, take a series of overlapping photographs showing the tire's entire circumference. Impressions on Glass: When the impression is on glass and when possible:

- Protect latent prints
- Position a colored card or piece of cloth that contrasts with the impression behind the glass
- Include in notes that this approach was used for contrast purposes to obtain the photograph
Impressions on a Mirror: When the impression is on a mirror, hold the flash to the side (oblique lighting); use a tripod to avoid being in the photograph. Dust Impressions: When photographing a dust impression or an impression in a soft material (e.g., wax or putty), use reflective lighting (also known as oblique lighting). When using reflective lighting, if detail does not appear sufficiently, block the ambient light and then experiment with positioning the light or flash in other locations until the desired result is achieved. Impressions on a Porous Surface: When the impression is on a

porous surface, position the light or flash wherever the best results or contrast can be achieved, such as at a 90-degree angle from the impression. Photograph bloodstains or other bodily fluid stains using color film or digital camera. Carefully place the camera plane perpendicular to the plane of the stain and ruler. Stay alert to the location of the bloodstains, so equipment isn't inadvertently touched to the stain.

- It is extremely important that the ruler be on the same plane as the impression.
- If the stain is on a wall, use an adhesive label with a ruler on it. Otherwise, tape a ruler beside the stain, or have an assistant hold the ruler beside the stain. Indicate upward direction.
- Ensure that the camera lens is perpendicular (90 degrees) to the subject. Adjust lighting when photographing the stain to obtain the best contrast and result.
- When the stain is on glass, position a colored card or piece of cloth that contrasts with the stain behind the glass, making sure to protect latent prints; include in the notes that this approach was used for contrast purposes to obtain the photograph.
- When the stain is on a mirror, hold the flash off to the side (oblique lighting) and use a tripod to avoid being in the photograph. The camera will show in the photograph when the mirror is 90 degrees from the lens. Additional Techniques for Close-up Photography If not using a digital camera, photograph wounds using color film. Carefully place the camera perpendicular relative to the wounds to obtain accurate measurements. Photograph the body of a



deceased person before moving it and also photograph it at the morgue. Include scales where appropriate.

- Adjust lighting when photographing the wounds to obtain the best contrast and result. Take multiple shots with the light held or placed at different angles to the subject in order to achieve the best results.

- Retake photographs of wounds such as bruises at different intervals to capture changes, such as in color, over several days. Photograph serial numbers on weapons or VIN numbers on vehicles:

1. Carefully place the ruler, camera and placard relative to the item to obtain accurately scaled photographs.

2. Place placard and ruler on the same plane as the weapon. It is extremely important, when the photo needs to be accurately scaled, that the ruler be on the same plane as the subject. The camera lens should be perpendicular (90 degrees) to the subject.

3. Position the lighting to obtain the best possible contrast and results. Take multiple shots with the light held or placed at different angles to the subject in order to achieve the best results.

4. Photograph vehicular damaged areas, the license plate and the registration decal.

5. Include the time that photographing was begun and completed in the notes.

6. Remove the film or download the digital images and store in a secure location according to departmental regulations.

Aerial Photographs

- Take aerial and/or overhead photographs of a scene to show geographic relationships of locations or objects and aid identification of objects shown in other photographs.
- Obtain aerial photographs by taking the pictures from a helicopter or plane. News footage can sometimes be a useful source of aerial photographs.
- Overhead photographs, in this context, are taken from above the scene, such as from a ladder, a second story, a cherry picker; they are not taken from the sky, as from a plane.
- Aerial and overhead photographs must be overlapping.
- Remove the film or download the digital images and store in a secure location according to departmental regulations.

Videography Equipment Needed

- Video camera
- Video kit with battery and recording media
- Personal protective equipment
- Additional sources of lighting
- Camera cleaning supplies
- Tripod
- Pen

Notebook General Considerations

- Plan the video shoot carefully. Take video of the scene in its original state from multiple angles and distances. Take video of fragile evidence first.



- Avoid disturbing the scene. Always take video of the scene before and after alteration, such as when placards and scales are placed near evidence.
- Exclude officers, bystanders, and others at a scene from the video. Turn audio off.
- Take overall (long-range) video to show where the crime occurred, midrange video to show relationships of evidence and other points of interest, and close-up video to show individual items and their characteristics.
- Use a sturdy tripod whenever possible to reduce movement while taking video. Take video from angles that result in the best representation of that scene. Avoid panning side to side or up and down. Avoid zooming while out of focus.
- Always use the designated safe route when moving through the scene.
- When applicable, include the names of those assigned to specific tasks in your notebook.
- Plan the videography route. Take video of transient objects, such as bloodstains or latent prints, as soon as possible. Move from the exterior to the interior of the crime scene, and from general to specific focus.
- The videography session should occur in an uninterrupted, systematic, focused manner. When planning the route, ask:
 - How did the victim or suspect arrive at or leave from the scene?
 - How was the crime committed?
 - Which items were handled?
 - Which items were moved?
 - Which items are broken or stained?

- Have potentially flammable vapors been detected at the scene?

Caution: Some equipment is flammable. When potentially flammable conditions exist, appropriate precautions must be taken.

- Go beyond boundary markers to take video only when necessary.

- Plan and prepare lighting for each scene and camera angle.

a) Front lighting places the camera lens at a 90-degree angle to the recorded object. It is often the most appropriate type of lighting to use at crime scenes.

b) Side lighting places the lighting source at a 45-degree angle to an object. It is used:

- o to show details such as tool marks, surface irregularities or textures
- o to show vehicle accident damage
- o when videotaping in closets or other small spaces
- o when videotaping polished surfaces

- Control the use of lighting by manually changing the focus settings and turning on/off flash settings.

- It is important to have a detachable flash or, if the flash is not detachable, another light source.

- Turn audio off.

- Record overall video of the house/building exterior, vehicles, other structures at the crime scene, including entrances and exits, and bystanders. Slowly pan in one directional sweep; never move the camera side to side or up and down.

- Overall video should include a 360-degree view of the entire scene including landmarks, entrances and exits, and identifying marks, such as a house number or license plate.

- Always use slow camera movements such as when panning and zooming.



- Use a tripod whenever possible, unless using it will disturb either the scene or other team members.
- When recording a long, narrow area, such as a side yard or train tracks, use a tripod and slow zooming. Always avoid walking while taping these shots
- Record entry/exit points from all possible angles. Show any paths used during the crime, when possible.
- While taking video of a scene, record related information in notes. Specify any changes made to a scene while taking video, such as when a light was turned on or the tripod left a mark.
- Film midrange and close-up exterior video (within 5 feet of subject) immediately following the overall recording of a scene.
- Record in a systematic focused way.

When recording video:

- Use slow camera movements such as when panning and zooming. Before zooming, stop filming, zoom, focus, then start the filming.
- Use the tripod whenever possible.
- When recording a long, narrow area, such as a side yard or train tracks, use a tripod and slow zooming unless using it will disturb either the scene or other team members. Always avoid walking while recording a long, narrow area.
- A high camera angle, such as with an overhead view, may be required to show individual objects that are on similar planes.
- Record entry/exit points from all possible angles. Show any paths used during the crime.

□ Move to the interior and take overall, midrange, and close-up video. When recording interiors:

- Always use slow camera movements such as when panning and zooming.
- Use a tripod whenever possible, even though it takes more time to set up, unless using it will disturb either the scene or other team members.
- When recording overall video in tight spaces, such as closet or bathroom, use a high camera angle from a corner.
- When recording a long, narrow area, such as a hallway or porch, use a tripod and slow zooming. Always avoid walking while recording these shots.
- When necessary and possible, use artificial lighting to get the best possible clarity.
- Consider using a blue filter over artificial light to achieve similar lighting as daylight.

□ Complete note-taking. Include in the notes such items as events that occurred while recording and the time recording was completed.

□ Remove the videotape from the camera or download the digital video before storing the camera in a secure location according to departmental regulations.

Summary: A well-documented scene ensures the integrity of the investigation and provides a permanent record for later evaluation.

Prioritize Collection of Evidence

Principle: The collection of evidence must be prioritized to prevent loss, destruction, or contamination. Policy: The investigator(s) in charge and team

members shall determine the order in which evidence is collected. Procedure:

The team member(s) should:

- a. Identify roles of the team members (e.g., scribe, collector, packager, etc.)
- b. Conduct a careful and methodical evaluation considering all physical evidence possibilities (e.g., biological fluids, latent prints, trace evidence).
- c. Focus first on the easily accessible areas in open view and proceed to out-of-view locations.
- d. Select a systematic search pattern for evidence collection based on the size and location of the scene(s).
- e. Select a progression of processing/collection methods so that initial techniques do not compromise subsequent processing/ collection methods.
 - Concentrate on the most transient evidence (e.g., most susceptible to environmental conditions) and work to the least transient forms of physical evidence.
 - Move from least intrusive to most intrusive processing/collection methods.
- f. Continually assess environmental and other factors that may affect the evidence.
- g. Be aware of multiple scenes (e.g., victims, suspects, vehicles, locations). Processing one scene at a time to avoid cross contaminating these various scenes.
- h. Recognize other methods that are available to locate, technically document, and collect evidence (e.g., alternate light source enhancement, blood pattern documentation, projectile trajectory analysis). Summary: Prioritization provides for the timely and methodical preservation and collection of evidence.

Crime Scene Search Methods

Principle: The thorough search of a crime scene helps ensure that all relevant evidence will be recognized, documented and collected. Policy: The investigator(s) in charge shall consider different search strategies for crime scenes depending upon locale and the number of officials available to aid in searching. Procedure: There are four types of search methodology that can be considered to search a crime scene:

- Lane or strip search
- Grid search
- Zone Search
- Spiral search

General Considerations

- The size of the lane of the search should be approximately the arms' length of the searcher.
- As the search of an area is completed, some marking should be made to indicate that the area has been completed.
- A mechanism should exist for the circumstance when potential evidence is found (e.g. who is called over, what path they should take, whether the other searches should halt moving until this finding is resolved). Lane or Strip Searches are accomplished by the searchers walking in parallel along defined lanes in the same direction.

A Zone Search involves dividing the area to be searched into adjacent zones. The smaller the size of the zone, the more methodical the search can be. Zone searches may be done by multiple searchers per zone.

Figure C - 9. Zone search Spiral search involves a spiral into (inward) or out from (outward) a crime scene. A practical disadvantage with outward spiral searches is the evidence may be destroyed as the searchers move to the center of the crime scene area to begin their outward search.

Collect, Preserve, Inventory, Package, Transport, and Submit Evidence

Principle: The handling of physical evidence is one of the most important factors of the investigation. Policy: The team member(s) shall ensure the effective collection, preservation, packaging, and transport of evidence.

Procedure: The team member(s) should:

- a. Maintain scene security throughout processing and until the scene is released.
- b. Document the collection of evidence by recording its location at the scene, date of collection, and who collected it.
- c. Collect each item identified as evidence.
- d. Establish chain of custody.
- e. Obtain standard/reference samples from the scene.
- f. Obtain control samples.
- g. Consider obtaining elimination samples.

- h. Immediately secure electronically recorded evidence (e.g., answering machine tapes, surveillance camera videotapes, computers) from the vicinity.
- i. Identify and secure evidence in containers (e.g., label, date, initial container) at the crime scene. Different types of evidence require different containers (e.g., porous, nonporous, crush-proof).
- j. Package items to avoid contamination and cross-contamination.
- k. Document the condition of firearms/weapons prior to rendering them safe for transportation and submission.
- l. Avoid excessive handling of evidence after it is collected.
- m. Maintain evidence at the scene in a manner designed to diminish degradation or loss.
- n. Transport and submit evidence items for secure storage.

Detailed Crime Scene Evidence Collection

Principle: The accurate and timely collection of evidence can lead to the reconstruction of a scene to determine if a crime has been committed, to the identification of suspect(s) and to the successful completion of the investigation. Policy: First responders, investigators and specialized personnel who are properly trained, equipped and prepared shall collect any and all potential evidence. Procedure: Appropriate personnel with the required knowledge and training should collect evidence in each of the following evidence categories as applicable.

Ignitable Liquids

Accelerants and ignitable liquids recognition and collection are best performed by specialized personnel. For scene personnel, evidence may be observed through smell, sight and sound, and should be recorded in notes.

- a. NEVER attempt to collect any evidence until you have spoken with an accelerants and ignitable liquids investigator or specialist.
- b. Ensure the safety of people at or near the scene.
- c. Follow the instructions provided by the accelerants and ignitable liquids investigator or specialist with whom you speak.

Bodily Fluids Bodily fluids include blood, semen, urine and other physiological fluids.

Blood Possible substrates with blood stains:

- Clothing
- Entire portable object
- Part of a non-portable object
- Stain on a non-porous surface

Equipment needed for bodily fluid collection includes: Paper bags, boxes, and envelopes; cotton-tipped swabs; paper bindles or other sterile swab storage container; distilled water or one-time use sterile water; scalpel, utility knife, or scissors; clean paper; waterproof pen; evidence tape; protective gloves; face protection. Commercial products are also available for crime scene collection of stains

Blood and other physiological fluids are fragile, and certain best practices must be maintained.

- a. Do not package bloodstained evidence in plastic bags.
- b. If possible, collect the entire stained garment.
- c. Avoid altering the stain or transferring blood from one portion of the garment to another; do not fold or crumple the garment.
- d. Be careful not to lose or contaminate any remaining trace evidence on the garment.
- e. Avoid excessive heat when collecting, transporting or storing blood evidence.
- f. Avoid moisture, water or other liquids.
- g. Avoid exposing the bloody evidence to strong light, especially UV light.
- h. Avoid touching, taking off gloves, or coughing/sneezing over or near the evidence.
- i. Describe the stain as a “red stain” or “apparent bloodstain”. Do not label it as blood if the stain has not been forensically identified as such.
- j. Mark package with appropriate cautions about contents, such as “Store Frozen” or by affixing Biohazard stickers.

Caution: Leaving evidence exposed at a crime scene can lead to contamination. It may not be possible to dry an item at the scene without risking contamination. Bodily Fluids Packaging Guidelines Documentation Ensure that the portion of the area or object with the stain has been documented as it was found.

When photographing the object:



- Include a scale and an identification label.
- Take one or more location photographs that show the object where it was found.
- Show the relationship of the object to other evidence in the photograph.

Marking Evidence Evidence labeling: Label a container such as a paper bag or envelope with your initials and identification number, the date and time, case number, evidence number, location and evidence description.

Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence. Evidence

description: The evidence description should include:

- Type of item (e.g., victim's shirt, glass, carpet fibers)
- Location of the stain
- Whether the stain is wet or dry
- Location of the item at the crime scene

Drying Wet Material

a. If the item is wet, place it on a clean piece of paper and allow it to dry before packaging, or transport it for drying at a laboratory facility or a properly outfitted evidence holding area.

b. If you have access to a drying rack, dry the item in it. Place a clean piece of paper on the floor of the drying rack. Hang the item over the paper.

c. If you do not have a drying rack:

1. Lay a clean piece of paper on a clean, flat surface in a secure location where the item will not be disturbed and contamination will be minimized.

2. Carefully place the item on the paper.
3. Be sure to keep the stain intact in its original form and avoid transferring the stain from one area of the item to another.
4. Allow the item to dry naturally. Never expose it to heat, such as from a blow dryer. Avoid exposing the sample to direct sunlight.
- d. Do not place two items in the same container for drying purposes. Clean the surfaces of the drying rack with a disinfectant such as 10% bleach solution after the item has been dried and removed.

Packaging

- a. Collect and label the paper on which the object was dried.
- b. Place the paper into a labeled container, as needed.
- c. Carefully pick up and fold the paper on or over which the object was dried. Contain any trace evidence that may have fallen on the paper.
- d. Label the folded paper, indicating the evidence number of the item that was dried.

Storing Blood Ideally, bloodstained items should be stored in a temperature-controlled environment (between 60-75 degrees, with less than 60% humidity).

If stored at ambient temperature:

- Place the container in a secure, dry storage area.
- Never expose the container to extreme heat, such as from a heater vent.
- Avoid exposing the container to direct sunlight.

Clothing

- a. Label a container that will be used to collect the object. (See Bodily Fluids Packaging Guidelines)

- b. Document the location of the garment with photography, measurement and sketching, where appropriate. If wet, dry according to guidelines
- c. Fold garment and, whenever appropriate, wrap the garment in clean paper.
- d. When folding a garment or large object:
 - 1. Do not crumple or wad any portion of the garment.
 - 2. Fold the garment only enough so that it fits into the container.
 - 3. Do not crease the stained area.
 - 4. Make sure, if using paper, that the paper protects trace evidence and prevents transferring the stain to other areas of the garment.
- e. Only wrap an item if wrapping the object will not disturb the position of a stain or mark.
- f. An item should be wrapped in clean paper when the location or pattern of the stain or mark is significant (such as a handprint or spatter pattern).
- g. Position the paper to keep the stain or mark intact in its original form. Avoid transferring any of the stain or mark to another portion of the object.
- h. Mark package with appropriate Biohazard cautions regarding contents.
- i. Place the item into the labeled container, such as a paper bag. The container should be large enough to allow air to circulate around the object inside of it. If an object is too large to be packaged in a container, protect the stained area(s) with clean paper during transport.
- j. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.

Specific Items Procedure: Entire Portable Object (e.g., a sheet)

- a. Label a container that will be used to collect the object. (See Bodily Fluids Packaging Guidelines)
- b. Document the location of the object with photography, measurement and sketching, where appropriate. Dry, if wet, by placing it on or over a clean piece of paper and allowing it to dry before packaging; or dry in place.
- c. Whenever appropriate, wrap the object in clean paper. Only wrap an item when wrapping the object will not disturb the position of a stain or mark.
- d. Objects should be wrapped in clean paper when the:
 - Location or pattern of the stain or mark is significant (such as a handprint or spatter pattern).
 - Object is saturated and liquid will leak through the container if not wrapped.
- e. Position the paper to:
 - Keep the stain or mark intact in its original form.
 - Avoid transferring any of the stain or mark to another portion of the object.
- f. Place the object into the labeled container. If an object is too large to be packaged in a container, protect the stained area(s) with clean paper during transport.
- g. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal. Specific Items

Procedure: Part of a Non -portable Object (e.g., carpeting, car seat)

- a. Label a container that will be used to collect the object. (See Bodily Fluids Packaging Guidelines.)
- b. Document the location of the stain with photography, measurement and sketching, where appropriate.
- c. When multiple stains are found, take one or more photographs that show the relationship among those stains.
- d. It is important to collect the entire stained area if the shape of the stain is significant (such as a handprint).
- e. If possible, cut out the entire stained area using a clean scalpel, utility knife, or scissors, including a large portion of the non- stained area. If the stain has been absorbed into multiple layers (such as carpet and carpet pad), collect a cut-out from each layer, Stained areas of carpeting are cut out for transport.
- f. If the entire stained area is too large to collect, cut out a smaller section of the area.
- g. Opposite the stained side, mark the orientation of the cut-out; for example, mark the area that pointed north, when collected.
- h. If the cut-out is wet, place it on clean paper and allow it to dry before packaging.
- i. Whenever appropriate, wrap the object in clean paper if wrapping the object will not disturb the position of a stain or mark.
- j. Objects should be wrapped in clean paper when the:

- Location or pattern of the stain or mark is significant (such as a handprint or spatter pattern). Object is saturated and liquid will leak through the container if not wrapped.
 - k. Position the paper to keep the stain or mark intact in its original form. Avoid transferring any of the stain or mark to another portion of the object.
 - l. Control Sample: Label a second container with your initials and identification number, the date and time, evidence number, location of the control in relation to the original sample, and description of the control sample.
 - m. Control sample number: Each piece of evidence, including the control sample, must have a unique number. A letter or number may be appended to the original evidence number to denote the control sample; e.g., If the original evidence number was #32, the control sample could be #32A or #32.1.
 - n. Control sample description: The description should include:
 - Type of material
 - Location of material
 - Location of the control sample in relation to the stain.
- Collect a control sample: Cut out a portion of unstained material.
1. First, locate an unstained area of the same material from which the original sample was taken. Select the least contaminated area possible (such as an unstained area of carpet).
 2. Cut out the control sample using a scalpel, utility knife, or scissors. (Use a clean blade; never use a blade that was used to cut another sample.) If multiple layers (such as carpet and carpet pad) of material were collected in the original sample, collect multiple layers for the control.
 3. On the side of the cut-out opposite the stained side (of the original non-control sample), mark the orientation of the cut-out to north when collected.

4. If the cut-out is wet, place it on clean paper and allow it to dry before packaging. Package the control sample separately from the corresponding stained material.

5. Place the cut-out in the container. Close the container and seal the entire opening with evidence tape.

Write your initials, identification number, and the date and time across the evidence tape seal. Specific Items Procedure: Stain on a Non-porous Surface (e.g., glass, a door, concrete surface)

a. Label a container that will be used to collect the item. (See Bodily Fluids Packaging Guidelines.)

b. Document the location of the stain with photography, measurement and sketching, where appropriate.

c. When multiple stains are found, take one or more photographs that show the relationship among those stains.

d. Pre-label with distinguishing markings any swabs that you will use.

e. If the stain is dry, moisten the cotton tip of a swab using two or three drops of distilled water. If the stain has some residual moisture in it, touch the dry swab tip to the moist area of the stain.

f. To avoid contamination, do not touch the cotton tip of the swab to any surface other than the sample area.

g. Hold the bottle of distilled water, or a one-time use vial of sterile water, above the swab. Use a minimum amount of water to moisten the swab: drop two or three drops of water onto the swab: Do not touch the tip of the water

bottle to the swab. Do not saturate the swab. (It should be moist, but not dripping wet.)

h. Swab the stain with the cotton-tipped end of the swab. Touch the swab gently and firmly to the

stain. Rotate the swab to ensure that the stain is collected on as much of the cotton tip as possible.

Do not smear the stain when swabbing it.

i. Dry the swab in a sterile container, swab dryer or drying box. If necessary, break off the end of the swab so it fits into the drying container.

j. Place the swab into a bindle; fold the bindle so it seals around the swab. Close the bindle and place it into an envelope large enough to allow air to circulate around the object inside of it. If the swab is thoroughly dried, it can be placed directly into a pre- labeled envelope.

k. If no bindle or swab drying box is available, use another sterile container that can hold the swab while it dries. Ensure that the swab is positioned so that air freely circulates around it.

Close the envelope or other container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.

m. Control sample: Label the second envelope with your initials and identification number, the date and time, evidence number, location of the control in relation to the original sample, and description of the control sample.

n. Control sample number: Each piece of evidence, including the control sample, must have a unique number. A letter may be appended to the original

evidence number to denote the control sample; e.g., If the original evidence number was #45, the control sample could be #45. A or #45.1.

o. Control sample description: The description includes location of the control sample in relation to the original stain.

p. Collect a control sample: Moisten the cotton tip of the second swab using two or three drops of distilled water. Swab an unstained area of the same surface from which the original swab was taken.

q. Dry the swab and package in the same manner as the stained sample.

Additional Physiological Fluid Types

Semen

a. Label a container that will be used to collect the item. (See Bodily Fluids Packaging Guidelines.) b. Document the location of the stain with photography, measurement and sketching, where appropriate.

c. Locating semen stains: Unlike blood stains, semen stains are not always obvious to the unaided eye at a crime scene. Semen stains are difficult to see under room and ambient lighting conditions. They may appear as a slightly yellow stain on light-colored fabrics or a whitish stain on dark-colored fabrics. Semen stains may also appear “crusty.” Still, many stains will be missed by normal or unaided visual examination; therefore, it is best to collect any item that may have semen stains. Common items to collect are: Victim’s clothing, especially underwear of sexual assault victims Suspect’s clothing Bedding (e.g., blankets, sheets) where an alleged sexual assault took place Towels Tissue paper, car seats

d. Detecting semen stains: Items that are impractical to submit to the laboratory (e.g., vehicles, carpets) can be screened using special lighting techniques. All visual lighting techniques are screening tests that can fail to detect semen stains; detection varies depending on the type of fabric or material on which the stain may be deposited. Visual tests will not discriminate between many possible physiological fluids or fluorescent contaminants. Forensic light source is an alternate light source (ALS) that may cause semen stains to fluoresce when viewed through an appropriate color filter. Optimal wavelength is dependent on surface characteristics of item. Certain surfaces appear to quench the fluorescent reaction. Argon ion laser causes a similar reaction as ALS. Long - wave ultraviolet (UV) lamp. As a precaution, analysts must wear plastic UV eye protection and cover any bare skin that will be exposed, such as hands and arms, during the UV examination or viewing. Semen stains may appear on a dark background. It should be noted that some clothing could fluoresce due to such materials as detergents and food stains.

A variety of substances, in addition to semen, may fluoresce under an ALS, avoid prolonged exposure of physiological fluids to the lamp. e. Collection of semen stains: Minimize disturbance, transference/swiping and contamination of the stain. Gloves should be worn during the collection and handling of the swab. Always collect a control sample. Order of preference for collecting dry semen stains should be:

1. Collect entire item bearing the stain. Ensure that the stain will not flake off or become dislodged.
2. Cut the stain from carpet, upholstery or other item that cannot be collected.

3. Moisten a sterile swab with distilled water, swab the suspected semen stain, and air dry prior to packaging.

S a l i v a

a. Label a container that will be used to collect the item. (See Bodily Fluids Packaging Guidelines.) b. Document the location of the item with photography, measurement and sketching, where appropriate.

c. Cigarette butts and used beverage cans or bottles are common types of saliva-containing evidence found at crime scenes. d. In sexual assault cases, consider swabbing the breast or other bodily areas to collect any potential saliva evidence if case circumstances dictate. Use a dry swab or moistened swab depending upon the circumstance of the stain. e. Use gloved hands or forceps to collect the item to prevent contamination.

Do not lick the envelope flap or cough/sneeze on sample, or contamination of the sample may occur. Standard/reference sample for Bodily Fluids In order to compare DNA types from suspect(s) and victim(s) to evidence analysis results, a standard/reference sample must be collected. In cases involving semen as evidence, it is not necessary to obtain a semen reference standard. Saliva or buccal swab standards are recommended. Note: Adhere to legal standards for search and seizure, if any, for your jurisdiction. DNA reference material: Cellular material obtained by buccal swab (see Male Suspect Evidence Collection, Including Sexual Assault below) is sufficient for DNA analysis.

The preferred method is to collect buccal or saliva swabs with several clean swabs. Finger-pricking the suspect and placing the blood drops on filter paper,

or specialty paper designed for this purpose, is acceptable. This reference material should be handled and processed as evidence.

Male Suspect Evidence Collection, Including Sexual Assault Equipment Needed Paper bags, boxes, and envelopes; cotton-tipped swabs; paper bindles or other sterile swab storage container; distilled water; toothpicks; clean butcher paper; comb; waterproof pen; evidence tape; protective gloves; face protection. Commercial products are also available for suspect evidence collection.

Do not package bloodstained or other biological evidence in plastic bags. Avoid altering the stain or transferring blood from one portion of the garment to another by folding or crumpling the garment. Be careful not to lose or contaminate any remaining trace evidence on the garment.

Avoid excessive heat when collecting, transporting or storing blood and other biological evidence. Avoid unnecessary moisture, water or other liquids. Avoid exposing the bloody evidence to strong light, especially UV light. Avoid touching, coughing/sneezing over or near the evidence.

Do not collect any samples without a court order, the suspect's consent or an exigent circumstance. Documentation Suspects should be photographed in the clothing that they are wearing, in both overall and midrange photographs. A separate photograph of the face as well as the hands should be taken. Any scar,

marks, tattoos and injuries, or lack thereof, should be photographed close-up. When photographing the subject, include a scale and an identification label.

Marking Evidence Evidence

Labeling:

Label a container such as a paper bag or envelope with your initials and identification number, the date and time, case number, evidence number, location and evidence description. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence. Evidence description: The evidence description should include: type of item (e.g., shirt, pants, shoes) from whom it was obtained color of clothing or other identifying marks on the clothing

Place suspect in a controlled area away from the victim's clothing and crime scene. Avoid having the collector of the victim's clothing collect the suspect's clothing so that cross-contamination is minimized. Trace evidence: Unfold both sheets of paper; lay one on top of the other. Examine suspect for any extraneous hairs, fibers, plant material, soil, glass, paint, etc., found on the suspect. Place into bindle. Fold bindle to contain trace evidence; return bindle to envelope; seal envelope and complete label. Note location(s) of recovery. Have suspect disrobe on the top sheet of paper. Place each garment in separate paper bags. Make sure any blood or semen stains are dry before packaging. Refold top sheet of paper to contain any collected debris. Pubic hair combing: Open bindle and place under pubic area. Using comb provided, comb pubic region for foreign material; fold paper to contain any debris collected and

comb. Place in envelope, seal envelope and label. Pubic hair standard: Pull (using fingers, or witness suspect pulling) pubic hairs from various areas of the pubic region. Place hairs in paper bindle, fold bindle to contain hairs, place bindle in envelope. Seal envelope and label. Pubic hair standards are not always required. Check with your forensic service laboratory for their preference. Penile and digit swabs: Use two cotton-tipped swabs held together and dampened with distilled water to swab the exterior of the penis and scrotum. Air-dry swabs or use a drying box, place dry swabs in envelope, seal and label. For digit swabs (if digital penetration indicated): Use 2 cotton-tipped swabs held together and dampened with distilled water to swab the fingers of each hand separately, to remove possible vaginal fluid, etc., deposited by the victim. Air-dry swabs, place swabs in envelope, seal and label. Foreign stains on body: Use two cotton-tipped swabs held together and dampened with distilled water to remove possible semen, vaginal fluid, saliva, urine, etc., deposited on suspect by victim. Bite marks: Photograph as above, swab inside and outside the bite mark with a moistened swab, concentrating any material on the tip. Air-dry swabs or use a drying box, place in envelope, seal and label. Collect and package evidence from each area separately. Note location of recovery. Fingernail swabbings/clippings: Swab under nails of each hand or clip the fingernails; place resulting residue and swab/clipping in a bindle. Fold bindle to contain debris; return bindle to envelope. Seal and label. Buccal swabs: (Suspect should have rinsed mouth and had nothing in mouth for 15 minutes prior to collection of this sample.) Holding multiple swabs together, swab the inside of the cheeks. Air-dry swabs or place

in a drying box, place in envelope, seal and label. Head hair standard: Pull (using fingers, or witness suspect pulling) 25 head hairs from various areas of the head. Place hairs in paper bundle. Fold bundle to contain hairs. Place bundle in envelope, seal and label. Note: Head hair standards are not always required. Check with your forensic service laboratory for their preference. Blood standards: See Standard/reference sample for Bodily Fluids Package remaining sheet of paper suspect is standing on. Package separately. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.

Bombs and Explosives Bombs and explosives recognition and collection are best performed by specialized personnel. For scene personnel, evidence may be observed through smell, sight and sound; these factors should be recorded in notes. NEVER attempt to collect any evidence until you have spoken with a bombs and explosives investigator or specialist. Follow the instructions provided by the bombs and explosives investigator or specialist with whom you speak.

Documents for crime scene investigations containing voluminous documents, a Forensic Document Examiner (FDE) can provide valuable on-site support. The FDE can be effective in screening large numbers of questioned documents to assist in selecting representative samples that are more likely to provide useful information for a specific investigation. Similarly, the FDE can effectively screen larger numbers of existing known writing samples, e.g., forms within records available in personnel offices. The expertise of the FDE for these screening tasks can save many hours of investigator work time, limit the

amount of unnecessary evidence taken for evaluation, and consequently reduce the time required for FDE examinations of the more relevant documents submitted. Equipment Needed Paper envelopes¹ and boxes; pie boxes lined with sheet cotton

Handle documents in a manner that prevents changes or alterations of the evidence. Never fold, unfold, staple, attempt to reassemble torn paper fragments, or allow shifting of torn or shredded paper fragments collected from waste containers, etc. Collect all questioned documents found at the scene. Check pockets for paper and paper fragments in clothing worn by suspects, victims, and other persons of interest at the scene; these fragments may be useful in associating the person with other document evidence.

Paper towels; rolls or large sheets of window screen fabric; manila or other similar folders; clean sheets of paper; waterproof pen; evidence tape; protective gloves; face protection.

Collect all tablets, notepads, spiral-bound notebooks, etc., containing visible writing or not, as these may contain pages with decipherable indentations and/or paper fragments to associate them with questioned documents

Toner on documents produced from photocopiers or laser printers, correctible typewriting, stamps, glossy photograph surfaces, and other document components can adhere to plastic document protectors, resulting in damage when the items are removed from the protectors. They should not be used.

Collect handwriting samples: letters, diaries, and other existing written documents at Pizza and regular pie-shaped boxes containing sheet cotton stapled to both inner surfaces will immobilize documents placed within for

safekeeping. This is particularly critical for charred documents and fragments. Indentations can be present from anonymous letters (some may be yet to surface) in an investigation. Paper fragments should be immobilized to avoid shifting and mixing that can delay reassembly of torn and shredded documents. The scene (standards); also collect requested writing samples (exemplars) from victims, witnesses, and suspects who may not be available later to render samples of their handwriting. Collect computers, printers, typewriters, adding machines, check protectors, rubber stamps, embossers, etc., for comparison purposes, when these devices may be related to questioned documents in an investigation. Check any service documentation for these devices that may also be useful in associating devices with questioned documents. Collect paper, printer cartridges (ink, toner, and imaging drums), pens, markers, and other supplies that may be related to content of questioned documents. Never write on packaging containing a collected document once the document is inserted. Avoid altering a stain or mark in any way, other than as necessary for evidence collection (e.g., moistening a dried stain for swabbing). Always change gloves and use sterile tools when collecting a new sample. Do not cough, sneeze, or talk over any sample being collected or dried, to prevent contaminating the documents with additional DNA. Documentation Ensure that the item has been documented as it was found. When photographing the item: Include a scale and an identification label. When possible, shoot accurately scaled photography. Take one or more location photographs that show the item where it was found. Show the relationship of the item to other evidence in the photograph.

Marking Evidence When acceptable, mark evidence containers instead of evidence

Mark documents for identification as inconspicuously and unobtrusively as possible, For instance, make small, limited markings in an area not intersecting any of the document printing or writing (e.g., very small initials and an abbreviated time/date entry along a bottom corner on the back of a document). Use a pencil for markings if documents might be examined later for latent prints.

Evidence container labeling:

Label a container for the object as specified by your agency (e.g., your initials and identification number, the date and time, evidence number, location, and evidence description). When selecting a container: For paper that is charred or burned, use a rigid, flat box lined with sheet cotton or similar material. Use an envelope when collecting checks, receipts, letters, reports, or other similar documents. Always use envelopes that are larger than documents collected. Evidence number: Each piece of evidence must have a unique number for identification. This number should correspond to the placard next to the evidence when photographing the items at a scene. Evidence description: The evidence description should include: Sufficient detail to distinguish each item from similar items collected as evidence.

Condition of the document, Orientation of the document to prominent nearby landmark label the container just before inserting evidence into them, Seal containers as soon as appropriate to avoid cross-contamination, unnecessary

movement of fragments, etc. Handle documents with gloves to avoid adding fingerprints that may obscure latent prints of evidentiary value. Use thicker paper, e.g., pieces of manila folders, to scoop up documents and insert them into paper envelopes or paper box evidence containers, etc. When necessary, pick-up documents by touching the smallest area possible, such as one corner. Avoid bending, folding, unfolding, stapling, or otherwise altering document evidence.

Drying Wet Documents, to scoop up wet single-page documents, use cardboard sheets, e.g., pieces of manila folders. Wet documents can be dried by placing them on a clean piece of paper towel or a sheet of window screen, and then placed in a secure location for drying. Sheets of clean paper towels, etc., should be spread beneath the area used to handle moist documents in order to collect any trace evidence that falls from the documents during handling. The items used to catch trace items may also need to be collected and handled as evidence. DO NOT attempt to unfold wet documents, as this should ONLY be done by laboratory forensic document examiners. Documents in a container of water or other liquid may need to be kept in the liquid for transportation to the laboratory and processing by forensic document examiners. Depending on the nature of the investigation, it may be important to avoid potential contamination that results from handling two documents in the same area at the same time.

Packaging

a. Place dried documents between clean sheets of paper, such as paper towels or cardboard sheets, to provide a protective covering before placing them into

labeled evidence containers, label evidence containers before placing objects into them to avoid degrading existing evidence. Handle documents carefully to avoid bending, folding, or otherwise degrading them. Handle documents appropriately to protect any latent prints that may exist.

b. Close the container and seal the entire opening with evidence tape. Write your initials and identification number and the date and time, as required, across the evidence tape seal.

c. Carefully pick up and fold the paper used as a catch-surface beneath drying documents. Retain any trace evidence that may have fallen onto this catch-surface paper from the evidence, by folding it inward from the corners. Then place the catch-surface paper in a labeled evidence container, as needed.

d. Label the folded paper, indicating the evidence number of the item that was dried; e.g., “This paper was used below evidence #36 while it was drying.”

e. Repackage the object using the original packaging and container if possible. Save all original packaging with evidence if it is not used for repackaging.

f. If the original container cannot be reused: Label the container indicating the evidence number of the item; e.g., “Original packaging for evidence #44.” Put the labeled, original packaging into a new container with the evidence it was used to collect.

Firearms Packaging Guidelines

Equipment Needed Rigid, paper firearm and ammunition boxes, or other rigid, paper containers; clean paper; waterproof pen; evidence tape; evidence tags;

and protective gloves. Avoid altering any stain on the firearm. Firearms should be unloaded and placed in a safe condition at the point of collection. If the collector is unsure of the proper procedure, assistance should be sought from a competent source such as a firearms instructor, departmental armorer, or an on-site firearm examiner. Always follow your department regulations. Ship firearms and ammunition according to your Department, do not cough, sneeze, or talk over any sample being collected or dried.

Documentation of Fire Arms

- a. When photographing the firearm, include a scale and an identification label.
- b. Take one or more location photographs that depict the object where it was found in relationship to other evidence at the scene.
- c. Turn over the firearm, and photograph the other side if stains, serial number, or safety position is apparent on that side.
- d. If no serial number is present, mark the firearm with identifying data, such as your initials and the time and date on at least one component that cannot be removed. Also, place identifying data on removable component(s), such as cylinder, grips or ammunition magazine.
- e. When there is no serial number on the firearm due to the firearm's age, or the removal or defacement of the number, mark the firearm on non-removable parts, such as the barrel and the frame.
- f. Photograph the firearm to capture any existing stains (such as blowback), the serial number, and the safety position.
- g. Place the mark in a location that will not interfere with existing markings.

MARKING FIRE ARM EVIDENCE

Labeling Fire Arm Evidence

Label the firearm box or a container for the object with your identifying data, such as initials and identification number, the date and time, evidence number, location, and evidence description. Evidence number: Each piece of evidence must have a unique number or identifying data. This number should correspond to the placard next to the evidence. Evidence description: The evidence description should include: Type of firearm Location of any stains on the firearm whether the stains are wet or dry Location of the firearm Label the container just before collecting an object, and seal the container immediately after collection. These actions help to protect the chain of custody. When handling the firearm, do not touch areas of the firearm where latent fingerprints are likely to be found (such as on smooth surfaces). Handle the firearm by touching only the areas that are checkered or knurled. Specific Items Procedure: Revolvers A revolver is defined as a repeating firearm that has a cylinder containing multiple chambers and at least one barrel for firing.

a. Mark the cylinder with your initials and the time and date. Put the mark in a location that will not interfere with existing markings.

b. Mark the cylinder position.

c. Document the condition of the firearm. Information needed includes:

Number of rounds in the chamber Type and location of any stains Serial number, make, model, and caliber



d. Protect the barrel, chamber, or other operating surfaces from contact with other objects.

e. Handle the firearm by touching only those areas that are unlikely to contain latent fingerprints, such as areas that are checkered or knurled. Note: Check agency evidence submission policy. For firearms that will be analyzed by a trained firearms examiner, a particular agency may require or prefer alternative procedures for submission of evidence to their laboratory.

f. Determine which way the cylinder turns. Cylinder turn can be either clockwise or counterclockwise, from the perspective of the shooter.

g. Create a cylinder diagram:

Cylinder diagram with as signed numbers for each chamber on the diagram, assign a number to each chamber in the cylinder. The chamber below the hammer/firing pin is number one. From number 1, continue numbering chambers as you move around it in the direction that the chamber turns. The diagram should show the state of each chamber – whether it contains a live or spent cartridge case, or is empty.

h. Document in your notes the type of projectiles/bullets contained in each chamber of the cylinder that you observe. It is important to note the type of projectile/bullet used because more than one type could be in use in the firearm at the same time; e.g., “Chamber one (1) contained .357 caliber ‘Acme’ full metal jacket.” Firearms should be unloaded and placed in a safe condition at the point of collection. If the collector is unsure of the proper procedure, assistance should be sought from a competent source such as a firearms instructor, departmental armorer, or an on-site firearm examiner.

- i. Remove the cartridge or case from the chamber carefully to avoid disturbing any potential trace evidence or latent prints on it. Mark each cartridge or case with the related chamber number.
- j. When labeling the cartridge or case, make all marks in or near the mouth of the casing. Do not label a cartridge or case near the rim, head, or primer.
- k. Mark each cartridge or case with the number of the chamber in which they were contained. The cartridge or case directly below the firing pin is in position number one. Start with number one and move in the direction of the cylinder rotation. Label the container into which you will place the ammunition with the same chamber number as you wrote on the cartridge or case. If necessary, wrap each object carefully so as to protect any potential trace evidence.
- l. Mark each chamber once you have marked the ammunition. On each side of the strap, mark the chamber with the number it was assigned when numbering cartridges and cases.
- m. Place the firearm, with available filled ammunition container(s), in the rigid box or container that you prepared for the firearm.
- n. If you are collecting multiple firearms, be sure to package each firearm and associated ammunition separately from other firearms.
- o. When the firearm is too large to fit into a container, securely attach an evidence tag to it. The evidence tag should include the following firearm information: Caliber Make Model Serial number
- p. Place the diagram into the labeled container with the firearm and filled ammunition containers. Make a copy of the diagram for your notes before placing the original copy into the box.



q. Close the container and seal the entire opening with evidence tape. Write your initials and identification number and the date and time across the evidence tape seal.

r. Consider the possible presence of bodily fluids, latent prints and trace evidence when handling the firearm or submitting it for processing. Specific Items Procedure: Other Firearms (e.g., Semi- Automatics, Automatics, Rifles)

Firearms packaging guidelines

a. Document the identity of the firearm or the listed firearm's markings.

b. If no serial number exists, mark the firearm with your initials and the time and date on at least one part that cannot be removed.

c. When the firearm has a bolt, mark the bolt with your initials and the time and date.

d. Information needed includes: The safety position on or off Existence of ammunition in the chamber Type and location of any stains Serial number, make, model, and caliber or gauge

e. Protect the barrel, slide, chamber, and other operating surfaces from contact with other objects.

f. Handle the firearm by touching only those areas that are unlikely to contain latent fingerprints, such as areas that are checkered or knurled. Firearms should be unloaded and placed in a safe condition at the point of collection. If the collector is unsure of the proper procedure, assistance should be sought from a competent source such as a firearms instructor, departmental armorer, or an on-site firearm examiner.

- g. If removing ammunition, mark each cartridge, case, shell, or magazine as it is removed from the firearm.
- h. Some departmental policies allow labels to be placed directly on a cartridge or case. When labeling the ammunition, make all marks near the mouth of the casing. Do not label ammunition near the rim, head, or primer.
- i. Mark each cartridge or case with the number of the chamber or position in the magazine in which they were contained, starting with number one, or use another schema that is consistent within your department for the way that the ammunition is stored in the firearm.
- j. Document, in your notes, the type of projectile/bullet that you observe in the chamber.
- h. It is important to note the type of projectile/bullet used; e.g., “Chamber contained .357 caliber ‘Acme’ full metal jacket.”
- i. Mark each magazine to note where cartridges, cases, or shells are found in it.
- j. On each side of the magazine, mark the position in which each numbered cartridge or shell is found. h. The mark should include the number assigned to the related cartridge, case, or shell. The number reflects the position in the magazine in which cartridge, case, or shell is found.
- k. Label a container into which you will place the ammunition with the same number as you wrote on the cartridge, case, shell, or magazine. The label on the box or container should include the number of the position in the magazine in which cartridge or case was found.
- l. If necessary, wrap each object carefully so as to protect any trace evidence on it.



m. When the firearm does not fit into a container, attach an evidence tag that describes the caliber, make, model, and serial number. The trigger guard is frequently the attachment point for the evidence tag.

n. The evidence tag should include the following information: • Caliber • Make • Model • Serial number.

Labelling cartridge casing

Place the firearm and ammunition container(s) in the container that you prepared for the firearm.

o. Close the container and seal the entire opening with evidence tape. Write your initials and identification number and the date and time across the evidence tape seal.

p. Consider the possible presence of bodily fluids, latent prints and other trace evidence when handling the firearm or submitting it for processing.

Ammunition Specific Items Procedure:

Embedded Ammunition Equipment Needed Hand tools (hammer, chisel/screwdriver, metal and plastic forceps, hand saw, etc.); flashlight; paper bags, boxes, or envelopes; clean paper; waterproof pen; evidence tape; personal protective equipment. Gunshot residue and fingerprints are extremely fragile. Collect gunshot residue and fingerprints as soon as possible. When possible, collect the entire object in which the ammunition is embedded.

Always wear protective gear when handling objects that could cut or otherwise cause injury to you. Do not cough, sneeze, or talk over any sample being collected or dried.

D o c u m e n t a t i o n o f p h o t o g r a p h i c a m m u n i t i o n

When photographing the object:

- Include a scale and an identification label.
- Take one or more location photographs that show the object where it was found.
- Show the relationship of the object to other evidence in the photograph.
- Use rods or strings to show ammunition entry and exit points
 - a. In your notes, document characteristics of the object in which the ammunition is embedded. Information needed includes: Type of object; Condition of object; Location of object; Color of object; Location of ammunition in the object; Type of ammunition, when possible; apparent entry angle
 - b. Collect the object containing the embedded ammunition, when possible.
 - c. If you were unable to collect the entire object, collect the embedded ammunition:
 1. Use available tools (hammer, chisel/screwdriver, forceps, hand saw, etc.) to carefully loosen and remove the ammunition.
 2. Handle the ammunition carefully to avoid destroying marks on it. Pad the tips of the forceps, for example, to protect the extracted item from forceps marks.
 3. When fragments and other items related to the embedded ammunition are found in the object or fall from the object, collect them also.



d. During collection, handle the object very carefully to avoid damaging evidence, or dislodging the embedded ammunition or any related residue.

Marking Evidence Evidence labeling: Label a container for the object with your initials and identification number, the date and time, evidence number, location and evidence description

Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence.

Evidence description: The evidence description includes: Type of object, Color of object; Type of ammunition, when possible; Location of the ammunition in the object, including orientation to key object feature(s); e.g., “Bullet of unknown type in piece of unstained wood beam in garage next to washing machine.” Label the container just before collecting an object, and seal the container immediately after collection.

Packaging Place the object in the labeled container

Seal the opening of the container with evidence tape. Write your initials and identification number, and the time and date across the evidence tape seal.

Specific Items Procedure: Fired Cases or Wads Equipment Needed Hand tools (hammer, chisel/screwdriver, forceps, hand saw, etc.); flashlight; paper bags, boxes, envelopes, and bindles; clean paper; waterproof pen; evidence tape; personal protective equipment. Gunshot residue and fingerprints are extremely fragile. Collect gunshot residue and fingerprints as soon as possible. Use a “druggist fold” to create bindles that will be used to hold cases and wads. Always use clean gloves when handling evidence. Do not cough, sneeze, or

talk over any sample being collected or dried. Documentation When photographing the object: Include a scale and an identification label. Take one or more location photographs that show the object where it was found. Show the relationship of the object to other evidence in the photograph Marking Evidence Evidence labeling: Label a container for the object with identifying data, such as your initials and identification number, the date and time, evidence number, location, and evidence description. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence. Evidence description: The evidence description includes: Type of case or wad Type of weapon used, when known Location where the case or wad was found; e.g., “.357 caliber spent case found lying on the garage floor, beneath the stool.”

Label the container just before collecting an object, and seal the container immediately after collection. Pick up the case or wad carefully to avoid damaging or dislodging fingerprints or other evidence. Use tools available to carefully loosen and remove the case or wad when it is difficult to reach and to avoid damaging evidence. Packaging

- a. Place the case or wad into the labeled envelope.
- b. When multiple cases or wads are collected from the same area, place each case or wad in a separate container. Each container must be individually labeled.
- c. Individual, labeled containers with cases found in the same area can be packaged together for transport. Wads should not be packaged with other ammunition or related objects.

d. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal. Specific Items Procedure: Loose, Unspent Ammunition
Equipment Needed Hand tools; flashlight; paper bag, box, or envelope; waterproof pen; evidence tape; protective gloves; face protection. Gunshot residue and fingerprints are extremely fragile. Collect gunshot residue and fingerprints as soon as possible. Always use clean gloves when handling evidence. Do not cough, sneeze, or talk over any sample being collected or dried. Documentation Photograph the ammunition and the location where it was found. When photographing the object: Include a scale and an identification label. Take one or more location photographs that show the object where it was found. Show the relationship of the object to other evidence in the photograph.

MARKING EVIDENCE

Evidence labeling:

Label an envelope for the ammunition with your initials and identification number, the date and time, evidence number, location and evidence description

Evidence number:

Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence. Evidence description: The evidence description includes: Type of ammunition; Location of unspent ammunition, Orientation of ammunition relative to firearm or other point of interest, when possible; e.g., “Acme full metal jacket case for a .357 caliber

revolver found on garage floor.” Label the envelope just before collecting an object, and seal the envelope immediately after collection. Photograph the ammunition and the location where it was found. When photographing the object: Include a scale and an identification label. Take one or more location photographs to depict the object where it was found in relationship to other evidence in the photograph. Pick up the ammunition carefully to avoid dislodging fingerprints or other evidence. Place the ammunition into the labeled container. Unless departmental regulations state otherwise, do not wrap the casing. Wrapping it could disturb evidence that has not already been collected.

Packaging

- a. Close the container and seal the entire opening with evidence tape. Write your initials and identification number and the date and time across the evidence tape seal.
- b. Collect and package any additional ammunition or related items.
- c. When multiple pieces of ammunition or related objects are found in an area, place each object in a separate container. Each container must be individually labeled. Those individual containers can then be packaged together for transport.

Tool Mark Evidence

A tool mark is any impression, scratch, gouge, cut, or abrasion made when a tool is brought into contact with an item, leaving an impression of the tool. In some cases, tool mark identification may link a person to the tool used in the commission of a crime.

Equipment Needed for Casting Casting kit (e.g., Duplicast©, Mikrosil©, silicone-type sealant); mixing pad; stirring stick; flashlight and other available light sources; paper envelopes and boxes; waterproof pen; measuring tape/ruler; identification labels; protective gloves; face protection. Photograph the impression before casting it. When making a cast, be prepared to act quickly and methodically. Time is often a critical factor in successfully making a cast. Always use clean gloves when handling evidence. Documentation Photograph the impression. When photographing the object: Include a scale and an identification label. Take at least one photograph where the camera lens is perpendicular or “orthogonal” to the tool mark surface. Take one or more mid-range location photographs that depict the object where it was found. Show the relationship of the object to other evidence in the photograph. Evidence Marking Evidence labeling: Label a container for the object with identifying data, such as your initials and identification number, the date and time, evidence number, location, and evidence description. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence.

Evidence description: The evidence description includes: Type of item being cast Location of the item being cast Orientation of the item being cast; e.g. to the north, to a feature of the object with the impression on it, or to a nearby object.

Casting the Evidence

- a. Label the container just before collecting an object, and seal the container immediately after collection.
- b. Clean out loose material from the impression, when possible, without disturbing the impression. Never discard a cast, regardless of condition when removed from the impression. Be sure to save and submit all casts to the laboratory.

Packaging

- a. Close the container and seal the entire opening with evidence tape. Write your initials, identification number, and the date and time across the evidence tape seal.
- b. Make sure that the container is also labeled with a description of the item cast, appropriate identifying data, such as your initials and identification number, the date and time, location and, when possible, the evidence number.
- c. If the item with the tool mark is collected, it should be packaged separately from a suspect tool(s) to prevent any additional marks, impressions or other damage. Never place the suspected tool(s) into the impression.

Trace Evidence

Trace Evidence deals with the collection of all forms of matter, natural or manufactured, usually very tiny materials, but may also be larger forms of matter. Examples are gas from a container (bag or metal cylinder), hair, pollen, stains (non-biological), volatile liquids, fibers, paint, glass and soil. Trace evidence can be easily destroyed, contaminated, or transferred, so take precautions when approaching the scene. Since trace evidence items are often difficult to see without the aid of magnification, the prudent course of action is

to collect items of evidence that may contain trace evidence. Care should be used when collecting weapons, as improper handling and packaging can compromise the trace evidence. Careful photography, documentation, and sketching are critical for the optimal use and interpretation/reconstruction of trace evidence. Always package items to prevent damage or alteration of the evidence: use packaging that corresponds to the size and type of the item and evidence. Always collect sufficient amounts of the trace evidence when possible. Do not package evidence if it is wet or damp. Do not package exemplar, standard/reference, or control samples with evidence. Package separately. Use of a bright or alternative light source may help in locating trace evidence.

Standard, reference, and control samples should be collected for laboratory comparison, examination, or elimination purposes. Collect enough for multiple analyses. Always wear powder-free gloves while collecting trace evidence to avoid contamination. Change gloves as often as needed to minimize contamination. Trace Evidence Documentation and Packaging Guidelines

Equipment Needed Paper/manila envelopes; paper bags; 4-inch and/or 6-inch glassine weigh paper (for paper bindles or self-made envelopes); 2.5- to 4-inch wide clear adhesive tape, clear acetate sheet protectors or clear secondary liners (non-silicone or silicone coated one-side); tweezers/forceps with different tips; one-quart and one-gallon metal friction lid cans with fitting lids (clean, empty paint cans); glass jars, bottles, and vials with Teflon®-lined screw cap lids or other appropriate air-tight inert lid; glass Pasteur pipettes with rubber bulb or all-in-one plastic transfer pipettes; transparent tape; cotton-tipped swabs; swab-drying boxes, or other sterile swab storage containers; distilled water; cutting

tool (knife, scalpel, single-edge razor blade, drywall saw, carpet knife, or box cutter); waterproof pen; evidence tape; powder-free protective gloves; face protection.

- Do not package evidence stained with bodily fluids or other liquids in plastic bags.
- Avoid altering the trace evidence in any way, other than is necessary for evidence collection (e.g., scraping paint from a metal surface).
- When possible, when storing evidence, use a freezer/refrigerator that is dedicated to evidence storage to guard against potential biohazard contamination or explosion hazards.
- Do not cough, sneeze, talk, or scratch yourself over any sample being collected or to be collected.
- When using tweezers/forceps, use only sufficient pinching force to collect item to prevent altering or damaging the trace evidence.
- Keep adhesive tape to be used in lifting evidence in a plastic bag until just before use to prevent contamination of the edges/side of the tape roll. Put unused portion of tape roll back into the plastic bag when finished with tape lifting.
- Do not place trace evidence directly into manila envelopes (of any size), paper envelopes, or paper bags without placing the evidence into a smaller, leak-proof container such as a glassine bindle, canister, Teflon-lined screw cap glass vial (or bottle/jar as size dictates), or other container.
- Keep clear acetate sheet protectors free from contamination by storing in an appropriate size manila envelope or plastic resealable bag.



□ Careful photography, documentation, and sketching are critical for the optimal use and interpretation/reconstruction of the evidence.

□ To reduce breakage and loss of evidence, secure glass containers (e.g., vials, bottles, jars) in cushioned metal friction lid cans with lids. Cushioning material may be balled-up paper towels. □ Using a swab to collect a trace evidence sample – whether liquid, powder, gel, or other form of matter, evidential or control – is a last resort. Documentation Ensure that the portion of the object with the stain or other trace evidence has been photographed and documented in notes and sketches.

When photographing the object: Include a scale and an identification label.

- Photograph with and without scale.
- Take one or more location photographs that show where the object was found in relation to other objects in the crime scene.
- Show the relationship of the object to other evidence in the photograph.

Marking Evidence Evidence labeling:

Label a container for the evidence object with your initials and identification number, the date and time, evidence number, location, and evidence description. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard or identification label next to the evidence and the evidence log as appropriate. Evidence description: The evidence description includes: • Type of evidence (paint, plant stem, glass, etc.) • Original location of the trace-evidence-containing object • Location of the trace evidence on the object (as appropriate)

When describing non-DNA-related stains, use the word “apparent” or the phrase “of unknown origin” when the source of the stain is not scientifically identified; e.g., “Pillow containing a brown stain of unknown origin found on the lower bed sheet on the bed.” Label the container just before collecting the object, and seal the container immediately after collection. These actions help to protect the integrity of the trace evidence and the chain of custody.

Packaging Wet Evidence

- a. If the item is wet, determine if the liquid is significant or relevant to the case (for instance, acid splashed on a victim). You may not wish to dry the item if the liquid is relevant to the case.
- b. If the liquid is not relevant, place item on a clean piece of paper in a secure location used for evidence drying, such as a drying rack, until it is dry.
- c. If you have access to a drying rack, dry the item in it. Place a clean piece of paper below the evidence to be dried in the drying rack. Lay the item on or hang it above the paper.
- d. If you do not have a drying rack:
 - Lay a clean piece of paper on a clean flat surface (e.g., table top) in a secure location where the item will not be disturbed and contamination or loss of the trace evidence due to drafts created by people walking by will be minimized.
 - Carefully place the item on or hang it over the paper. If possible, gently fold the paper over the object to cover it from airborne particles (such as hair or fibers) that might land on it.
 - Allow the item to dry naturally. Never expose it to heat or significant drafts, such as from a blow dryer. Avoid exposing the sample to



direct sunlight. e. Do not place two items in the same container for drying purposes.

f. If the liquid is relevant to the case, determine if the liquid is:

- related to a fire or explosion and in or on an object (e.g., ignitable liquid in carpet) – contact fire investigator or bomb technician or forensic fire debris or explosives analyst as appropriate
- involved in injury or damage to another person or property and on an object
 - o if small sample – secure in appropriate size glass container with a Teflon-lined screw cap lid or other airtight, non-reactive lid.
 - o if large sample – document location of wet area by photography, notes, and sketches, then cut or remove the wet area and treat as if small sample
- soaking the object or there are drops of liquid on the surface (non-porous surface) – using gloved hands, attempt to squeeze liquid drops into glass container or use swab to collect drops and treat as small sample
- forming a large drop or pool of liquid. Transfer liquid using glass Pasteur pipette or plastic transfer pipette into appropriate size glass vial.

g. Consider appropriate hazardous labeling.

Packaging Dry Evidence

a. When object has dried, carefully pick up and fold the paper on or over the object that has dried. Contain any trace evidence that may have fallen on the paper.

b. Label the folded paper, indicating the evidence number of the item that was dried; e.g., “This paper was used below evidence #44 while it was drying.”

- c. If possible, repackage the object using the original paper and container.
- d. If the original container cannot be reused:
 - 1. Save all original packaging as evidence if it is not used for repackaging.
 - 2. Put the labeled, original packaging into a new container with the evidence it was used to collect.
 - 3. Label the container indicating the evidence number of the item; e.g., “Original packaging for evidence #44.”
- e. When possible, place glass vials, bottles, and jars into a cushioned metal friction lid container to reduce breakage.
- f. To reduce breakage and loss of evidence, secure glass containers (e.g., vials, bottles, jars) in cushioned metal friction lid cans with lids. Cushioning material may be balled-up paper towels.
- g. Do not place trace evidence directly into manila envelopes (of any size), paper envelopes, or paper bags without placing the evidence into a smaller, leak-proof container such as a glassine/paper bindle, canister, Teflon-lined screw cap glass vial (or bottle/jar as size dictates), or other container.
- h. Keep clear acetate sheet protectors free from contamination by storing in an appropriate size manila envelope or plastic resealable bag.
- i. Tape lifts should be placed onto clean, clear (not translucent) acetate sheet protectors. Then place the sheet protectors into appropriate size manila envelope.

Collecting a Control or Comparison Sample

A control sample is one that the collector knows, that does not appear to have evidence present. It represents the matrix material on which the evidence rests, for instance a piece of wallboard or carpeting. A comparison sample may have evidence present without the collector's knowledge (e.g., fire debris), but represents the matrix material on which the evidence rests or is made of the same matrix material as the evidence (e.g., glass fragments collected from a broken window). It will be compared to the evidential sample. These will be referred to as "control" samples. Label a second container for the control sample with your initials and identification number, the date and time, evidence number, location of the control in relation to the original sample, and a description of the control sample. Clearly identify this sample as a control (or comparison) sample (e.g., write the words "Control Sample" or "Comparison Sample" in bold print on the container). Control sample number: Each piece of evidence, including the control sample, must have a unique number. A letter or number may be appended to the original evidence number to denote the control sample (e.g., if the original evidence number was #32, the control sample could be #32A or #32.1.) Control sample description:

The description includes:

- Type of sample or matrix material (e.g., wallboard)
- Location of the material

• Location of the sample in relation to the evidence sample Collect a control sample: Using the appropriate tool, cut out, collect, or remove a portion of the same matrix material on which the evidence sample rests or was part of the evidence sample (e.g., paint smear evidence on paint). Locate an area of the same material from which the original trace evidence sample was taken, but without evidence being present (e.g., undamaged area of paint). Cut out, collect, or scrape the control or comparison sample using, as appropriate, a scalpel, utility knife, wallboard saw, carpet knife, single edge razor blade, or scissors. (Whenever possible, use a clean blade)

Processing the Scene

Never use a blade that was used to cut an evidential or other control sample without changing or thoroughly cleaning.) If multiple layers (such as carpet and carpet pad or multi-layer paint) of material were observed or collected in the original sample, collect all of the multiple layers for the control or comparison sample. A liquid sample should be collected using a glass or plastic transfer pipette and placed into a glass Teflon-lined screw-cap vial or bottle of the smallest permitted size for the sample. Using a swab to collect a liquid trace evidence sample (evidential or control) is a last resort. Put the swab into an appropriate size screw-cap vial or other air-tight container. Trace Evidence Collection Procedures Remove an Entire Portable Object Part of a Non - Portable Object Scrape from Non - Portable Object Lift with Tape or Adhesive Recovery with Tweezers Swab a Surface Soil or Rock Samples Gunshot Residue Collection Procedure: Remove an Entire Portable Object

Trace Evidence Documentation and Packaging Guidelines.

1. Photograph and document the object with the apparent trace evidence.
2. Whenever appropriate, wrap the entire object in clean (butcher) paper or in a brown paper bag.
 - Only wrap an object when doing so will not disturb the position of a stain or other trace evidence (glass fragment, metal fragment, paint smear, etc.).
 - Objects should be wrapped in clean paper when the location or pattern of the stain or other trace evidence is significant (such as a spatter pattern) or the object is saturated and liquid will leak through the container if not wrapped.
3. Position the paper to keep the trace evidence intact in its original form. Avoid transferring any of the trace evidence to another portion of the object.
4. Place the wrapped object into the brown paper bag or other labeled container.
5. If an object is too large to be packaged in a container, protect the stain or trace evidence area(s) with clean paper during transport.
6. Close the container and seal the entire opening with evidence tape. Write your initials, the identification number, and the date and time across the evidence tape seal. Ensure that any small openings in the package are also sealed. Place initials over these seals.
7. If an object is too large to be packaged in a container, protect the relevant area(s) with clean paper during transport.
8. Repackage the object using the original packaging, if possible, and reseal.

9. Store the object in the sealed container.
10. Place the container in a secure, dry storage area.
11. Never expose the container to extreme heat, such as from a heater vent.
12. Avoid exposing the container to direct sunlight.

Procedure: Cut from a Non -Portable Object Follow Trace Evidence Documentation and Packaging Guidelines

- a. Label a container for the object to be collected with your initials and identification number, the date and time, evidence number, location, and evidence description.
- b. Photograph, sketch, and take notes on the object with the trace evidence or stain.
- c. Collect a larger area than where the trace evidence is observed, especially if the shape or pattern of the trace evidence or stain is significant (e.g., paint spray, broken glass pane, etc.).
- d. If possible, cut out the entire area using a scalpel, single-edge razor blade, utility knife, carpet knife, dry wall saw, scissors or other tool as needed to remove section. If the trace evidence has been absorbed into multiple layers (such as carpet and carpet pad), collect a cut-out from each layer.
- e. If the entire stained or evidence area is too large to collect as one piece, using the appropriate tool, cut out a smaller section of the area and label to re-assemble the sections later if needed.
- f. On the side of the cut-out opposite the side with a stain or trace evidence, mark the orientation of the cut-out to north when collected. Be careful not to dislodge trace evidence while marking.



g. If the item is “wet”, determine if the liquid is water, a biological fluid, volatile, or hydrocarbon.

1. If water or biological fluid, place it on or over a clean piece of paper and allow it to dry before packaging.

2. If the liquid is volatile, acidic, caustic, or a hydrocarbon, the liquid itself may be significant evidence and must be packaged in an airtight container to prevent evaporation. Contact a fire investigator, fire debris analyst, or bomb technician for instructions. (See Trace Evidence Documentation and Packaging guidelines)

h. Whenever appropriate, wrap the cut object in clean paper, glassine bindle, or place in appropriate size glass or plastic container or metal friction lid can.

i. Close and seal the labeled container after having placed the object into it. Write your initials and identification number and the date and time across the evidence tape seal.

j. If an object is too large to be packaged in a container, protect the area(s) with clean paper during transport. Control sample: Label a second container for the control sample with your initials, identification number, the date and time, evidence number, location of the control in relation to the original sample, and a description of the control sample. Clearly identify this sample as a control or comparison sample (e.g., write the words “Control Sample” or “Comparison Sample” in bold print on the container). Control sample number: Each piece of evidence, including the control sample, must have a unique number. A letter or number may be appended to the original evidence number to denote the

comparison or control sample (e.g., if the original evidence number was #32, the control sample could be #32A or #32.1.)

Control sample description:

The description includes:

- Type of sample or matrix material (e.g., wallboard)
 - Location of the material
 - Location of the control sample in relation to the evidence sample
- Collect a control sample: Using the appropriate tool, cut out or remove a portion of the same matrix material on which the evidence sample rested or was part of the evidence sample (e.g., locate an area of the same material from which the original trace evidence sample was taken but without evidence being present such as an undamaged area of paint).
- a. Cut out the control or comparison sample using, as appropriate, a scalpel, utility knife, wallboard saw, carpet knife, single-edge razor blade, or scissors. (Use a clean blade; never use a blade that was used to cut an evidential sample on a control sample without a thorough cleaning or replacement.) If multiple layers of material (such as carpet and carpet pad or multi-layer paint) were observed or collected in the evidential sample, collect all of the multiple layers present for the control or comparison sample.
 - b. On the opposite side of the evidential side of the original non- control sample, mark the orientation of the cut-out to north when collected.
 - c. Whenever appropriate, wrap the control sample in clean paper or other appropriate containment.

d. Place the object into the labeled container. If an object is too large to be packaged in a container, protect the sample with clean paper during transport.

e. Close the container and seal the entire opening with evidence tape.

Write your initials and identification number and the date and time across the evidence tape seal. Treat the control sample with the same care as you treat the transfer evidence sample. Collection Procedure: Scrape from Non-Portable Object Follow Trace Evidence Documentation and Packaging Guidelines Equipment Needed Paper/manila envelopes; brown paper bags; 4-inch and/or 6-inch glassine weigh paper (for paper bindles or self-made envelopes); tweezers/forceps with different tips; cutting tool (knife, scalpel, single-edge razor blade, or box cutter); waterproof pen; evidence tape; powder-free protective gloves; face protection.

- Use scraping when the entire object may not be collectable (e.g., quarter panel of car, etc)

- Often scraping is used to collect evidence on non-porous surfaces too large to collect, but may be used to collect evidence on porous surfaces (e.g., stain on car seat, furniture fabric, canvas, etc.)

- Paint transfer is commonly located on the object on the impacted surface.

Collect the clothing

and shoes of people who have been in the area of the painted surface at the time of and since the impact.

- Collect paint control-comparison samples, when the entire item cannot be removed, using the scrape method.

- Always use clean and/or fresh, disposable scraping tools. Change blades frequently when applicable.
- Always change gloves and use thoroughly cleaned tools when collecting each new sample (between every evidential or control sample.)
- The stain or marking should be dry for scraping.
- Do not use a commercially manufactured envelope of any kind as they have gaps that permit leakage. If a commercial envelope must be used, seal around all edges of the envelope with tape.
- Label a container for the object to be collected with your initials and identification number, the date and time, evidence number, location, and evidence description.
- Photograph, sketch, and take notes on the object with the trace evidence or stain.
- Collect as much of the evidence area as possible using a scalpel, single-edge razor blade, utility knife, or other tool as needed to remove section.
- On vertical surfaces place or tape a self - made envelope or glassine bindle below the area to be scraped before scraping to capture all of the scraping.
- By scraping the sample, typically all shape or pattern of the trace evidence or stain is lost. Evidence labeling: Label a container for the evidence-scraped object with your initials and identification number, the date and time, evidence number, location, and evidence description. Use a druggist fold to create a glassine paper bindle or self-made envelope. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence and the evidence log as appropriate.

Evidence description:

The evidence description should include the:

- Type of scrape evidence (paint, apparent vomit, etc.)
- Original location of the object containing the trace evidence
- Location of the trace evidence on the object (as appropriate)
 - a. Label an appropriate container just before collecting the scraping, and seal the container immediately after collection.
 - b. Place a large sheet of clean paper beneath the area that you will scrape. The paper is used to contain any debris that breaks loose while you are scraping. Avoid standing on the paper while you scrape.
 - c. Place or tape a self-made envelope or glassine bindle below the area to be scraped before scraping to capture all of the scraping possible. Do not use a commercially manufactured envelope of any kind as they have gaps that risk leakage.
 - d. Scrape off as much of the material as possible and go as deep as possible to obtain all layers. Note: When scraping flakes, attempt to leave the flake as intact as possible as you remove it.
 - e. When scraping paint, as when found on a car, scrape down deep to the base material, such as the metal of the car. Collect all layers of paint available (all evidence layers and all matrix layers on which evidence rests) in one scrape. This method applies to all trace evidence to be scraped.
 - f. If ample evidence is present, attempt to collect a sample that is at least the size of a quarter when scraping material that is not a flake. Otherwise, scrape and collect all of the evidence present.
 - g. Scrape the material directly into a

paper bindle or self-made envelope. A bindle or self-made envelope is preferred for collection to be able to recover as much of the evidence from inside of it as possible.

- h. Close and seal the bindle or envelope to prevent leakage.
- i. Never use staples to seal a bindle containing trace evidence.
- j. Place a small section of tape at the point where the top is tucked into the bottom just sufficient to keep the bindle top tucked into the bottom. Do NOT over wrap the bindle or envelope with tape.
- k. Place the bindle or self-made envelope into an appropriate size labeled container.
- l. Take necessary precautions to avoid breaking or damaging larger flakes by affixing the bindle or envelope to a piece of cardboard or other rigid material. Secure the bindle or envelope to keep it from moving with minimum amount of transparent tape (not evidence tape or packing/tape lifting tape).
- m. Fold the paper that was below the paint when scraped, and place it into a labeled container.

Keeps all evidence from the same scrape together using detailed labeling of the containers and evidence tape

- n. Close the container and seal the entire opening with evidence tape. Write your initials and identification number and the date and time across the evidence tape seal. Control sample: Label a container for the control or comparison sample with your initials, identification number, the date and time, evidence number, location of the control in relation to the evidence sample, and

a description of the control sample. Clearly identify this sample as a control or comparison sample (e.g., write the words “Control Sample” or “Comparison Sample” in bold print on the container). Control sample number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence and on the evidence log; e.g., “#36. A Control sample for evidence #36.”

Control sample description:

The description includes:

- Type of item scraped (e.g., paint, apparent brown stain on glass, etc.)
 - Location of the object scraped • Location of the scrape on the object
- Collect a control sample: Collect a comparison or control sample by scraping an area close to or adjacent to the transfer scraping. (Use a clean, new blade; never use a blade that was used to scrape another sample.) Collect a control or comparison sample that is, at a minimum, the size of a quarter.

Collect a sample that cuts through all layers of material down to the solid or base surface, as when collecting a paint sample from a car.

a. Place or tape a self-made envelope or glassine bindle below the area to be scraped before scraping to capture all of the scraping possible. Do not use a commercially manufactured envelope of any kind as they have gaps that permit leakage.

b. Scrape off as much of the material as possible and go as deep as possible to obtain all layers. • Note: When scraping flakes, attempt to leave the flake as intact as possible as you remove it.

c. When scraping (e.g., paint, as when found on a car) scrape down deep to the base material, such as the metal of the car. Collect all layers available in one scrape if possible.

d. Place the scraping directly into the bindle or self-made envelope. Never package comparison or control samples with transfer evidence samples.

e. Place the bindle or envelope into the labeled container.

f. When the bindle or envelope contains larger flakes, place it onto a rigid material similar to the evidence sample then into a container and secure it to prevent the bindle or envelope from moving.

Take necessary precautions to avoid damaging the flakes.

g. Close the container and seal the entire opening with evidence tape. Write your initials and identification number and the date and time across the evidence tape seal.

h. Store the object in the sealed container. Treat the control or comparison sample as you would treat the transfer evidence sample. Collection Procedure: Lift with Tape or Adhesive Follow Trace Evidence Documentation and Packaging Guidelines Additional Equipment Needed Clear tape (packing or box sealing tape with a width of 2.5 inches to 4 inches) on a roll (tape lift), sheet lift tape, clear acetate page protector or acetate sheets, clear secondary liners (non-silicone or silicone coated one-side), and clean butcher paper.

A tape lift has the advantage over vacuuming by collecting evidence most recently deposited relative to the crime.

Suitable types of tape to use are packing or box-sealing tape with a width of 2.5 inches to 4 inches.

- Do not use fingerprint lift tape, latent print tape strips or lifters unless as a last resort. While excellent for fingerprints, these often have insufficient adhesive for trace evidence.
- Do not use masking tape, clothing hair-removal tape, duct tape, or other non-transparent tapes.
- Do not use paper as a backing for tape adhesive. Use acetate page protectors or clear secondary liners.
- Hair is frequently located at a crime scene near a weapon, near the point of impact, and below a deceased person, on clothing worn during the crime.
- Fiber is frequently located at a crime scene on clothing, carpet, furniture, and bedding. Fiber is usually defined as carpet and clothing filaments.
- Broken glass is frequently found on clothing, shoes, head hair, skin, tools, and weapons.
- Paint is commonly located on the object that impacted the painted surface, the area below/around the painted surface that was impacted, and the clothing and shoes of people who have been in the area of the painted surface at the time of or since the impact.
- Do not freeze the lift.
- To collect paint samples when the entire item cannot be removed, use the tweezers collection method first, then the scrape method, then the tape lift method.
- Always use powder-free clean gloves when handling evidence.
- Do not cough, sneeze, scratch, or talk over any sample being collected or dried.

□ whenever possible, collect the entire item and submit it to the lab.

□ Collect trace evidence (e.g., hair, fiber, paint, etc.) using tweezers when possible, then use tape lifts. Marking Evidence Evidence number: Each piece of evidence must have a unique identification number. This number should correspond to the placard next to the evidence and the evidence log as appropriate. Evidence labeling: Label the acetate page protector or secondary liner along an edge and a container for the sheet or liner with your initials, identification number, the date and time, evidence number, lift location (e.g., lower, bed sheet, left-front shirt). Label each tape lift with your initials, the date, and identification evidence number. As appropriate (e.g., when collecting a series), add additional specific location information to the tape end. On the tape, a letter may be appended to the original evidence number to denote the lift. If the original evidence number was #36, for example, the number on the bindle could be #36A or #36.1. If several lifts are from the same evidence item (e.g., shirt) then the same sub-number (e.g., #36A) can be used for all lifts on the same acetate page protector or unique numbers used for each separate lift, according to department preference. Evidence Description:

The evidence description should include the:

- Type of evidence
- Location of the evidence
- Description of surface from which lift is taken
- Brief description of evidence, when appropriate, such as “blue-colored glass” or “apparent smokeless powder”



□ On the envelope, avoid using adjectives, such as “long” or “blonde”, to describe hair; e.g., “Hair and other items lifted with tape from green area rug lying across the floor two feet east of the back door.”

□ On the bindle, when it is used for debris, refer to the evidence with which the content of the

bindle is associated; e.g., “Debris from evidence #36.”

□ Label the container just before collecting a sample, and seal the container immediately after collection.

Lifting Trace Evidence (Tape on a roll or as used in sheets are considered “tape.” Acetate sheets, page protectors, and release liners will be “backing.”)

a. Remove a little longer clear tape from the roll than will be needed to tape lift the intended surface. Fold approximately an inch of tape onto itself on the ends.

b. Place the tape evenly on the surface to be tape lifted. Press repeatedly and firmly along the length of the tape. Peel the tape off of the surface carefully so as to keep evidence from falling off of it.

If surface pattern is important, place adhesive side of tape on the backing.

If pattern is not important, repeatedly place the tape onto new areas of the surface with potential evidence several times, but before the tape loses stickiness. Place the adhesive side of the tape onto backing.

- If lift tape is being used, open the tape lift and remove the protective seal over the sticky part of

the lift.

- If clear tape is being used, remove a piece of tape.

c. While holding the tape over clean paper, close the lift tape or place the piece of clear tape against the sheet of acetate.

- If lift tape is being used, carefully place the backing over the sticky surface.
- If clear tape is being used, carefully place the tape on the acetate.

d. Be sure not to let any evidence fall from the tape lift or clear tape.

e. If the tape lift or clear tape is not sticky enough to securely attach to the backing or acetate, use an additional piece of tape to secure it to the backing.

f. Label the tape with your initials, identification number, the date and time, evidence number, and location as appropriate. The backing should be labeled along a margin parallel to the direction of the tape with your initials, identification number, the date, evidence number, location and description
Packaging.

a. Place the tape lift into the labeled envelope. The envelope and tape backing should have identical information on their labels.

b. Save any debris that fell off of the tape onto the clean paper by folding the paper into a bundle and placing it into an envelope. Take care to fold the paper in such a manner as to contain all debris; using a “druggist fold” to make a bundle is recommended. The container should be labeled in the same manner to match the lift envelope’s label.

c. If a control or comparison tape lift is made, package separately from the evidence tape lift.

d. Close the container and seal the entire opening with evidence tape. Write your initials, identification number, and the date across the evidence tape seal.

e. Store lifts in a secure, dry storage area until they are submitted. Collection Procedure: Recovery with Tweezers Follow Trace Evidence Documentation and Packaging Guidelines.

Additional Equipment Needed Fresh disposable or clean, smooth-tipped tweezers Paper/manila envelopes; 4-inch and/or 6-inch glassine weigh paper (for paper bindles or self-made envelopes); tweezers/forceps with different tips; waterproof pen; evidence tape; powder-free protective gloves; face protection

Hair is frequently located at a crime scene near a weapon, near the point of impact, and below a deceased person, on clothing worn during the crime.

Fiber is frequently located at a crime scene on clothing, carpet, furniture, and bedding. Fiber is usually defined as carpet and clothing filaments.

Broken glass is frequently found on clothing, shoes, skin, tools, and weapons.

Paint is commonly located on the object that impacted the painted surface, the area below/around the painted surface, and the clothing and shoes of people who have been in the area of the painted surface at the time of or since the impact.

Always use clean, powder-free gloves when handling evidence.

Do not cough, sneeze, talk, or scratch over any sample being collected or dried.

Broken glass is frequently found on clothing, shoes, head hair, skin, tools, and weapons.

Paint is commonly located on the object that impacted the painted surface, the area below/around the painted surface that was impacted, and the clothing

and shoes of people who have been in the area of the painted surface at the time of or since the impact.

Marking Evidence Evidence

Labeling:

Label a container for the bindle or envelope with your initials, identification number, the date and time, evidence number, location, and evidence description. Label the bindle or envelope with your initials, identification number, evidence number, the date, and evidence description. Evidence Number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence and the evidence log as appropriate.

Evidence Description: The evidence description should include the:

- Type of evidence
- Location of the evidence
- Brief description of evidence, when appropriate, such as “glass fragments” or “hair.” Avoid using adjectives, such as long or blonde, to describe objects being collected, such as hair; e.g., “Fibers and hair found on a denim-covered couch.”

Label the bindle and container just before collecting an object, and seal the container immediately after collection. These actions help to protect the integrity of the sample and the chain of custody. Collecting Evidence

a. Gently pick up the evidence using clean tweezers. Use only clean tweezers when collecting a piece of evidence.

- b. Grasp the evidence gently and with only sufficient force to securely collect the evidence with the tweezers. When collecting hair, be sure to capture the root of the hair when possible since DNA is contained in the hair root.
- c. Continue using the tweezers on all evidence large enough to be collected and place the evidence into the bindle or envelope. Use and label a different bindle for different apparent types of evidence, different areas of collection (as appropriate), or for other reasons.
- d. Close the bindle or envelope to contain the evidence and protect it from contamination or leakage. When closing the bindle, make sure to contain the evidence placed into it.

P a c k a g i n g

- a. Place the bindle into an envelope or other container.
- b. Close the container and seal the entire opening with evidence tape. Write your initials, identification number, and the date across the evidence tape seal.
- c. Store the sealed envelope or container. Collection Procedure: Swab a Surface
Follow Trace Evidence Documentation and P ackaging Guidelines For most trace evidence, all other methods should be considered superior and therefore, the most appropriate ones attempted first before using a swab to collect evidence. Often the swab collects too little of the evidence or embeds the evidence within the fibers of the swab making removal or recovery difficult for analysis. Reasonable uses for a swab exist, however, such as recovery of pepper spray from the face of a subject or dye-pack contents from a vehicle interior or hands of a subject.

MARKING EVIDENCE

Evidence labeling:

Label a container for the swab with your initials, identification number, the date and time, evidence number, location, and evidence description.

Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence and the evidence log as appropriate. Evidence description:

The evidence description includes:

- Type of evidence
- Location of the stain
- Whether the stain is wet or dry When describing stains, use the word “apparent” or the phrase “of unknown origin” when the source of the stain is unidentified; e.g., “Brown stain of unknown origin on bathroom floor.” a. Label the container just before collecting the swab, and seal the container immediately after collection. These actions help to protect the integrity of the evidence and the chain of custody. b. If the stain is dry, moisten the cotton tip of a swab using an appropriate solvent depending on the evidence such as two or three drops of distilled water.

Do not saturate the swab with solvent, just enough to “dampen” the swab with solvent. To avoid contamination, do not touch the cotton tip of the swab to any surface other than the sample area. Also ensure that the portion of the area or object with the stain has been photographed and documented in notes before proceeding.



c. Hold the bottle of solvent above the swab. Use a minimum amount of solvent to moisten the swab: drop two or three drops of solvent on the swab.

- Do not touch the tip of the water bottle or transfer pipette to the swab.
- Do not saturate the swab. (It should be moist, but not dripping.)

d. In some instances, distilled water may not place the stain in solution so a different solvent such

as rubbing alcohol may need to be used. Consult with your local crime laboratory personnel for specific procedures to use.

e. Swab the stain with the cotton-tipped end of the swab. Touch the swab gently and firmly to the stain. Rotate the swab to ensure that the stain is collected on as much of the cotton tip as possible. Do not smear the stain when swabbing it.

f. Dry the swab.

g. Place the swab into a container (e.g., bindle, self-made envelope, or drying box). If necessary, break off the end of the swab so the swab fits. Then, close the bindle and place it into a container.

Close the container and seal the entire opening with evidence tape. Write your initials and identification number and the date and time across the evidence tape seal. Control sample: Label the control container with your initials, identification number, the date and time, evidence number, location of the control in relation to the original sample, and description of the control sample. Clearly identify this sample as a control sample (e.g., write the words “Control Sample” in bold print on the bindle). Control sample number: Each piece of evidence, including the control sample, must have a unique identification. A

letter or number may be appended to the original evidence number to denote the control sample; e.g., If the original evidence number was #32, the control sample could be #32.A or #32.1.

CONTROL SAMPLE DESCRIPTION:

The description includes:

- Description of the stain what is being collected.
 - Location of the control sample in relation to the stain evidence
 - Location of the original stain Label the container just before collecting an object, and seal the container immediately after collection. Collect a control sample: Moisten the cotton tip of the control swab(s) using the same solvent as the evidence. Hold the bottle of distilled water or transfer pipette containing solvent above the swab and drop two or three drops of water or solvent on the swab.
 - Do not touch the tip of the transfer pipette with solvent to the swab.
 - Do not saturate the swab. (It should be moist, but not dripping wet or saturated.)
- a. Locate an unstained area of the same surface from which the evidence stain sample was taken.
- Swab the unstained area of this surface.
- Touch the swab gently and firmly to the stain.
 - Rotate the swab to ensure that the stain is collected on as much of the cotton tip as possible.
- b. Allow the swab to dry while continuing evidence collection. Place the dry swab into a bindle or self-made envelope. Then, place the bindle into a manila

or other envelope. Close the envelope and seal the entire opening with evidence tape. Write your initials, identification number, and the date across the evidence tape seal. Treat the control sample as you would treat the evidence sample. Do not package control or comparison samples with evidence samples. Collection Procedure: Soil and Rock Samples Follow Trace Evidence Documentation and Packaging Guidelines.

ADDITIONAL EQUIPMENT NEEDED

Compass; measuring tape; gardener's hand shovel; mason's trowel; screwdriver

- Always use clean tools and individual bindles when collecting soil or rock samples.
- If an impression, print, body or other evidence is in the area, photograph and document it in notes before collecting nearby soil or rocks.
- Collect samples from the known crime scene, any "alibi" site(s) (e.g., a site that the victim or accused claims to have visited), or a "representative" site (such as a site where prints that match recovered shoes or tires are found)
- When soil is firmly attached to a movable object, collect and air dry the object before packaging it. If it cannot be collected, gently scrape samples from the object onto clean paper.
- Never package soil directly into commercially manufactured envelopes or bags.
- Always package soil in a sealable container: glass or plastic vials, bottles or jars with screw cap lids, self-made envelope, paper bindle, or other container.

- Collect minimum of three tablespoons of soil from each location go a little deeper than at least as deep as the evidence sample appears to have penetrated the ground soil. Usually the top layer of soil is only disturbed for the evidence sample.
- Collect a comparison sample close to the suspected or known evidence sample location and at various locations around the evidential sample up to 100 feet, attempting to include varieties of soil in the scene area.
- Layering of soil can be important to show recent or historical presence at a location. This is particularly true of vehicle collection. Preserve layering whenever possible.

Documentation Ensure that the portion of the object with the soil has been photographed and documented in notes and sketching. Include measurements of collected soil (evidence or control/comparison samples) locations.

MARKING EVIDENCE EVIDENCE LABELING:

Label a container for each soil sample with your initials, identification number, the date and time, evidence number, location, and evidence description. Label each bindle, envelope, bottle, or jar with your initials, identification number, evidence number, the date and time, location, and evidence description.

Evidence number:

Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence (evidence, control, or comparison) and the evidence log as appropriate. Evidence description: The evidence description includes:

- Location of each soil sample relative to specific landmarks at the scene
- Whether the soil was wet or dry when collected
- Whether the soil contains any detectable odor or other unusual characteristics or objects
- Estimated amount of sample When describing soil contents, use the word “apparent” or the phrase “of unknown origin” when the source of the stain/mark is unidentified; e.g., “Soil sample taken from approximately 1 foot north of apparent boot print (#6A.1).”

a. Determine where to begin sample collection.

1. If a victim died on the ground, and the body has not been removed, collect the sample from as close to the body as possible without disturbing it. Otherwise, prepare to collect a sample from the center of where the body laid and other appropriate locations of the body.

2. If collecting a series of samples along the path of an impression, determine the start and end points of the path. The starting point is the place where the first impression is made and the first sample must be collected, then along the path traveled by the subject.

3. Examine the ground for trace evidence that may not have been collected.

b. Dig straight down into the soil/rock to collect a sample of three tablespoons to one cup of the soil.

Be sure to start with clean digging tools. Clean the tools after each sample. Use the mason’s tool, gardener’s hand trowel, and screwdriver as needed to dig straight into the ground or rocks.

c. Place the soil sample into the container (bottle, jar, vial, bindle).

- Mix soil as little as possible, keeping in mind the potential for layering of soil
 - To avoid contamination and leakage, it is critical that each sample is stored in its own sealed container and kept apart from other soil/rock samples and tools that were used.
- d. Collect and package the remaining samples in separate bindles. Take additional samples at distances of 1, 10, 25, and 50 feet from the original impression/impact point. Size of area comprising the scene will determine how far out the samples need to be taken. Collect soil and rock samples at regular distance intervals from the original impression.
- Take at least four samples at varying compass points each time the distance from the initial evidence area and sampling location is increased.
 - Ensure that your notes and the label on the container include the compass direction and distance from the previous location, or the initial evidence sample, or permanent markers used for measurement in the scene. Whichever reference point is used, consistently use that point throughout.
- e. If the sample is wet, place it on a clean piece of paper in a secure location used for evidence drying, such as a drying rack, until it is dry.
- f. If drugs or ignitable liquids are suspected, the sample must be frozen. Contact a fire investigator or fire debris analyst if ignitable liquids are suspected.
- Keep the sample as cold/cool as possible helps to slow degradation. Natural components of some soils may degrade the composition of added chemicals in

the sample. Packaging Place each initial container (bottle, jar, vial, bindle) into its labeled container.

Only one soil sample per container, do not package evidence with comparison/control samples. Close the container and seal the entire opening with evidence tape. Write your initials, identification number, and the date and time across the evidence tape seal. Gunshot Residue Collection Methods Follow Trace Evidence Documentation and Packaging Guidelines Equipment Needed Gunshot residue (GSR) collection kit or GSR collection stubs; paper envelopes; paper towels; clean paper; waterproof pen; evidence tape; powder-free protective gloves; face protection.

- Determine if the suspect(s), victim(s), or witness (es) should be tested; collect the GSR as soon as possible.
- Do NOT use tape lifts in place of a GSR kit stub.
- The instructions included in the GSR kit should always be followed.
- Sample the hands for GSR using the collection kit as soon as possible. If collection cannot be made immediately on contact with the subject, individually bag the subject's hands using paper bags and not plastic bags (as plastic may cause hands to sweat).
- Good GSR samples can generally be obtained from the web portions of the hands.
- GSR collection kits should contain materials (e.g., carbon-coated adhesive stubs or adhesive-coated discs) required to perform scanning electron microscopy (SEM) residue tests.
- Do not use GSR kits that have swabs or color tests.

- Do not allow the suspect(s), victim(s), or witness(es) to wash their hands or subject the hands to any liquids after the shooting, or any rubbing onto other surfaces (e.g., clothing, bag on hand, furniture, etc.).
- Keep GSR kits away from firearms evidence.
- Evidence such as vehicles can also be tested for the presence of GSR, by using the same procedure as would be used on hands.

FOOTWEAR AND TIRE IMPRESSIONS

Tire Impression Evidence

- A vehicle may be associated or disassociated to a crime scene by tire impressions.
- A comparison of the accident/crime scene impressions can result in an identification, inclusion or elimination of a tire.
- Impression(s) can be found in a variety of substrates including soil and snow, as well as on cement and asphalt.
- The evidentiary value of a comparison usually depends upon the quality of the impression and the manner in which it is documented and collected.

Casting Considerations

The decision to cast is affected by the conditions of the substrate that the impression is in or on. Impressions in fine, humus soil, wet sand, and even snow are often excellent candidates for casting. Coarse substrates may not always be the best substrate for retaining detail of the tire impression(s). It is recommended that all impressions be photographed and cast, to recover the

maximum amount of impression detail. Documentation5 Photography is a valuable way of collecting impression evidence for later comparison. As with all evidence, overall photographs should be taken using a standard-format lens showing the impressions in relation to the other features of the scene. It is critical that distortions are minimized by adhering to the following:

- Impression photography requires the use of a tripod and detachable flash.
- Documentation must include a photograph with a measurement scale. The scale should not be placed over or across the impression. The scale must be level with the bottom of the impression and be approximately the same size as the impression for proper documentation.

The scale should contain case identification information.

- Case number
- Orientation

- Documentation should indicate the direction of travel, if this can be determined.
- The camera should be mounted on a tripod directly over the impression, with the film plane parallel to the impression.
- The impression should be shaded from direct sunlight.
- It is recommended that the detachable flash or other light source be at an angle of 45 degree or less depending on the depth of the impression. A variety of flash angles are recommended. These oblique light photographs should be taken with the direction of the flash coming from at least 3 different directions around the impression.

- Tire impressions are photographed in an overlapping series that should continue the length of the impression in which detail is present.
- Each frame should overlap by approximately 20%, and no more than two feet should appear in each frame. A scale or tape measure placed the length of the track will help reconstruct the length of the entire impression from the separate photographs, single-lens reflex or similar cameras with changeable lenses should be used for capturing impression evidence.

T I R E V E H I C L E M E A S U R E M E N T S

The following measurements should be recorded:

- The track width of a vehicle is the distance between the center of the tire mounted on one side of the vehicle to the center of the tire on the opposite side. The front and rear track widths may be different.
- The wheelbase of a vehicle is the distance between the center of the front axle and the center of the rear axle.

Tire Impression Measurements Measure the track width and wheelbase recorded in the impressions, if possible:

- The track width may be measured from the inside of one tire track to the outside of the adjacent tire track, if they can be determined to be a pair made by a single vehicle.
- If the positions of the front and rear tires can be determined where a vehicle stopped, these positions can be measured to determine an approximate wheelbase measurement.

Casting After photography

Casting may be performed to document the impression in three-dimensional form.

The decision to cast is affected by the substrate conditions and other environmental factors.

- Impressions should be photographed before casting.
- Do not remove soil adhering to the cast or attempt to clean the cast after recovery as this may damage cast detail.
- Place each casting in a protective, breathable container after drying.

Enhancements/Optimization Chemicals and/or powders may be used to enhance or optimize impression(s). It should be determined prior to chemical application if a sampling of the blood is required, as the chemicals used to optimize the impression(s) may interfere with DNA analysis.

Forensic light sources may optimize visualization and photography of the impression(s). Examination of the impression(s) using a forensic light source may be conducted prior to applying any chemicals or powders. Blood does not fluoresce, but views as black in infrared (IR) range and may offer contrast between the impression and the substrate of the item it is on.

FOOTWEAR IMPRESSION EVIDENCE

A shoe or boot may be associated or disassociated to a crime scene by footwear impressions. A comparison of the crime scene impressions can result in an identification, inclusion or elimination of a footwear outsole. Impressions can be found in soil, snow, on counters, tile floors, doors, wood and vinyl furniture,

paper items, as well as other surfaces. The decision to cast an impression is affected by the conditions of the substrate the impression is in or on. Impressions in fine, humus soil and even snow are often excellent candidates for casting. Coarse substrates may not always be the best substrate for retaining detail of the tire impression(s). It is recommended that all impressions are photographed and cast, to recover the maximum amount of impression detail.

Documentation Photography is a valuable way of collecting impression evidence for later comparison. The evidentiary value of a comparison usually depends upon the quality of the impression and the manner in which it is documented and collected. Overall photographs should be taken using a standard-format lens showing the impressions in relation to the other features of the scene. It is critical that distortions are minimized by adhering to the following:

- Impression photography requires the use of a tripod and detachable flash.
- Documentation must include a photograph with a measurement scale.
- The scale should not be placed over or across the impression.
- The scale must be level with the bottom of the impression and be approximately the same size as the impression for proper documentation.
- The scale should contain case identification information:
 - Case number
 - Orientation
- The camera should be mounted on a tripod directly over the pattern, with the film plane parallel to the impression.

- The impression should be shaded from direct sunlight for flash photographs.
- It is recommended that the detachable flash or other light source should be at an angle of 45 degrees or less depending on the depth of the impression. A variety of flash angles are recommended. These oblique light photographs should be taken with the direction of the flash coming from at least 3 different directions around the impression.
- The entire impression should be captured in one frame unless overlapping photographs are needed to capture sufficient resolution. Single-lens reflex or similar cameras with changeable lenses should be used for capturing impression evidence.

Casting After photography

Casting may be performed to document the impression in three-dimensional form. The decision to cast is affected by the substrate conditions and other environmental factors. Impressions should be photographed before casting.

- Do not remove any soil adhering to the cast or attempt to clean the cast after recovery as this may damage cast detail.
 - Place each casting in a protective, breathable container after drying.
- Two-dimensional Impressions Two-dimensional impressions are usually a deposit or removal of material to or from a surface. These may be found on paper items, doors, counters, tile floors, and other hard surfaces/substrates. There are generally two ways footwear impressions are made:
- by the removal of dust or other material from a surface by adhering to an outsole leaving a void (negative) impression the deposition of a material or

contaminate such as blood, dirt, and oil present on a footwear outsole, transferred to a surface, leaving an impression. If possible, submit the entire item that has the impression on it. If that is not practical, the impressions may be lifted using various techniques such as:

- Electrostatic dust lifter
- Gel print lifter
- Tape or clear adhesive material (if no other material is available)

Enhancements/Optimization⁶ Chemicals and or powders may be used to enhance or optimize impression(s). It should be determined prior to chemical application if a sampling of the blood is required, as the chemicals used to optimize the impression(s) may interfere with DNA analysis. Forensic light sources may optimize visualization and photography of the impression(s). Examination of the impression(s) using the forensic light source may be conducted prior to applying any chemicals or powders. It should be noted that blood does not fluoresce, but views as black in IR range and may offer contrast between the impression and the substrate of the item it is on.

Collection Procedure: Cast an Impression.

Casting an impression should only be attempted by someone trained and experienced in the technique employed.

Equipment Needed

Casting kit (dental stone); mixing container (such as a heavy duty baggie or a bucket); stirring stick; material for forms; water; packaging materials; waterproof pen; evidence tape; measuring tape/ruler; identification labels;

protective gloves; face protection. Documentation Properly photograph the impression before casting.

Marking Evidence Evidence labeling:

Label a container for the object with your initials and identification number, the date and time, evidence number, location, and evidence description. Evidence number: Each impression must have a unique number. This number should correspond to the placard next to the evidence. Evidence description:

The evidence description includes:

- Type of item being cast
- Location of the item being cast
- Orientation of the impression to north, to a feature of the object with the impression on it, or to a nearby object.

Casting the Evidence

- When making a cast, be prepared to act quickly and methodically. Time is often a critical factor in successfully making a cast.
- When casting tire impressions, cast as much of the tire impression as possible.
- Use dental stone for casting in dirt, soil and sand as well as snow. Sulfur may be used for casting in snow.
- Impression coating materials such as SnowPrint Wax, stabilizers (e.g., hairspray) and highlighters (e.g., paint) may be used depending upon conditions present.
- Casts should be marked with the impression identifier, general evidence collection information (date, case number, etc.) and with a directional indicator.

- Casting material should be allowed to thoroughly harden before removal from surface.
- Prepare the casting material. Follow the manufacturer's instructions for preparing the casting material.
- A sturdy plastic bag is used for mixing dental stone for footwear impressions, a bucket is usually necessary for mixing casting material for tire tracks.
- The initial pour of the casting material should occur off the impression to avoid damaging detail; the casting material should be allowed to flow into the impression.

Casting impressions with dental stone in soil and sand:

a. If necessary, prepare impressions for casting:

When casting a fragile impression, it may be necessary to apply a fixative. Care should be exercised when applying fixatives to minimize any possibility of damage to the impression.

When casting in dense soils, it may be necessary to apply a release agent. Care should be exercised when applying release agents to minimize any possibility of damage to the impression.

b. Add appropriate amount of water to pre-measured amount of dental stone. The average footwear impression requires approximately two (2) pounds of dental stone and approximately ten (10) ounces of water. The amount of water required may vary depending on the casting product. The resulting mixture



should have the viscosity of heavy cream. The viscosity of the mixture may need to be adjusted based upon the nature of the impression.

c. Mix continuously for a minimum of 3-5 minutes so that the powder can thoroughly absorb the water.

d. Pour casting material carefully outside the perimeter of the impression and direct the flow into the impression. Ensure the impression is completely filled and/or covered evenly. In the event that the casting material does not flow completely into the impression, the top surface of the casting material can be agitated to help it flow. Casts should be of sufficient thickness to avoid breakage. If necessary, additional casting material may be poured over the top of the original cast to complete the cast and/or add thickness. For fragile and shallow impressions: pour casting material from outside the perimeter so that it rapidly flows over the impression. A thinner mixture of casting material is necessary for this technique. Avoid pouring directly onto the uncovered impression. Note:

Larger quantities of dental stone can be mixed in a bucket to cast large segments of tire impressions.

Impressions under water may be cast using dental stone and specialized techniques. Casting impressions with dental stone and sulfur in snow:

a. If necessary, prepare impressions for casting. It is noted that snow varies considerably in texture and type. Application of highlighting materials (such as Snow Print Wax™ or aerosol paints) may be advantageous during photography. These materials may or may not be necessary for the casting process.

b. To increase the contrast of the detail, a thin application of highlighting spray may be directed at the impression from an oblique angle. The application of highlighting sprays to the snow impression may increase melting; therefore, the impression may need to be shielded from the sun until it can be photographed and cast.

c. A thick application of SnowPrint Wax™ may be applied if needed before using the dental stone casting material.

d. Casting with dental stone: 1. Add a heaping tablespoon of Potassium Sulfate to the pre- weighed bag of dental stone.

Add snow to the water source and place the bags of dental stone in the snow to pre-cool the ingredients.

Add the appropriate amount of water to the pre- measured dental stone. A thicker mixture should be used for snow.

Pour the casting material from outside the perimeter and direct the flow into the impression. The surface of the casting material can be agitated to help it flow.

e. Casting with sulfur:

Snow impressions may be cast using sulfur; however, it is recommended that specific training in this technique be acquired before using.

Packaging

a. Collect and package debris that may have fallen from the cast when it was removed.

b. Store the packaged debris with the cast.

c. Do not clean the cast.



d. Package the debris in a bindle or other container that will securely store it. Label the container with your name, identification number, and the date and time. Place the cast into the labeled container. When necessary, use shock absorbing and protective materials to cushion the cast.

A cast is delicate and can be easily damaged. Package the cast so that it is stable and secure and the face of the impression is up and protected from disturbance during transport.

If a cast is too large to box, wrap it in clean paper and shock-resistant material (such as bubble-wrap). The goal is to seal the impression and protect it from damage during transport.

e. Never discard a cast, regardless of condition when removed from the impression. Be sure to save and submit all casts to the laboratory. Even a broken cast may be useful during the examination process.

f. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.

g. Make sure that the container is labeled with a description of the item cast, your initials and identification number, the date and time, location and, when possible, evidence number.

COLLECTION PROCEDURE:

Lifting Dust Footwear Impressions

Equipment Needed Fingerprinting kit (fingerprint powder, soft-bristled brush, lifting tape); contact paper and clear acetate; electrostatic dust lifter; adhesive

and gelatin lifting materials; Mikrosil™ or other polyvinylsiloxane (PVS) casting materials; flashlight and other available light sources; clean wrapping paper; envelopes; waterproof pen; evidence tape; measuring tape/ruler; identification labels; protective gloves; face protection.

- Photograph the impression before collecting or removing it.
- An electrostatic dust lifter is appropriate to use only when the impression is left in dry dust.
- Whenever possible to do so without damaging the impression, collect the object containing the impression.
- Always use clean gloves when handling evidence.
- Always collect soil/rock samples from the immediate surrounding area when the impression is on the ground. Documentation Properly photograph the impression before lifting.

MARKING EVIDENCE

Evidence labeling:

Label a container and an identification label for the developed impression with your initials and identification number, the date and time, evidence number, location, and evidence description. Make sure that the information on the container matches the identification labels.

Evidence number:

Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence.

Evidence description:

The evidence description includes:

- Type of print collected
- Location of the impression
- Orientation of the impression to north, or to a feature of the object with the impression on it, or to a nearby object Label the container just before collecting an object, and seal the container immediately after collection.

Lifting the Impression

When lifting impressions, examiners should use the least destructive method first, if in doubt, treat all impressions as dry-origin and apply the methods listed below. If unsuccessful, attempt collection as indicated for wet-origin impressions. All procedures shall be performed when applicable and noted when appropriate. The order and use of these individual techniques is determined by considerations such as substrate, components of the impression, and environmental conditions. Electrostatic dust lifter Electrostatic lifting is useful for the detection and lifting of dry-origin dust and residue impressions that are the result of tracking from dry, dirty surfaces onto relatively cleaner surfaces. Electrostatic lifting is normally the first technique used, as unsuccessful attempts will not prevent subsequent lifting and enhancement techniques. There are a number of electrostatic lifters available. Consult the manual provided by the manufacturer for specific operating instructions.

All of these devices utilize a film which has a black side and an aluminum-coated side. The black side of the film is placed against the impression, and a

high-voltage charge is applied to the film, resulting in the transfer of the dry dust or residue impression.

□ To visualize the lifted impressions, the lifts should be examined in a darkened room with a high-intensity light source held at an oblique angle to the surface of the lift.

□ The lifting film should never be reused.

□ Smaller lifts can be stored in individual clean file folders. These folders should never be reused. □ Larger lifts can be stored by carefully rolling with the aluminum side out. After rolling, the edge can be secured with a small piece of tape.

□ Electrostatic lifts are fragile and impressions can be destroyed by any wiping action across the surface of the lift. Consideration should be given to photographing lifts prior to packaging. Electrostatic lifts retain a charge and should never be packaged in cardboard, cardboard boxes, or plastic bags.

Adhesive and gelatin lifters

□ Footwear-size adhesive and gelatin lifters are used for the lifting of dust and residue impressions, wet-origin impressions, as well as impressions developed with fingerprint powder.

□ Gelatin lifters are available in white, black and clear. White lifters provide greater contrast with impressions enhanced with dark-colored powders. Black lifters provide greater contrast with light-colored powders and residue impressions. Clear lifters normally do not provide good contrast. Gelatin lifts of residue impressions should be photographed as soon as possible after collection.

□ Adhesive lifters are available in white and clear. They include footprint-sized sheets and various widths of rolled tapes. White backgrounds are recommended for clear adhesive. Clear adhesive on a clear background is not recommended for residue impressions, these lifts are normally used for impressions developed with dark-colored powders. Residue or powdered impressions may also be lifted with tape if other lifting material is not available. Sections of tape may be overlapped and lifted as a single lift to recover the entire impression intact. The tape- lifted impression should be placed on a contrasting or white background. Rolled tapes are available in five-inch widths and are preferred to narrower tapes.

□ Dental Stone can be used to lift impressions such as mud and tire residues from surfaces such as concrete and tile. Refer to the “Guide for Casting Footwear and Tire Impression Evidence” for mixing instructions. A thick layer of dental stone can be poured over the impression area and lifted when dry. Note that a border of cardboard or other material should be placed around the impression to aid the lifting of the dental stone after drying.

□ Mikrosil™ or other polyvinylsiloxane (PVS) casting materials can be used to lift impressions enhanced with powder, from any surface. These products lift the complete powdered impression and are particularly useful on textured surfaces.

Packaging

- a. Insert the lifted impression into the labeled envelope.
- b. Do not bend or fold the lifted impression to fit it into the envelope.

c. Close the envelope in which the print is stored and will be transported, and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.

Motor Vehicles Procedure:

Examine a Motor Vehicle Equipment Needed Boundary markers (rope, tape, cones, etc.); clean paper bags, boxes or envelopes; evidence tape; waterproof pen.

- Process a vehicle with the same caution and detailed approach as you would any crime scene. Obtain warrants as you would other crime scenes if required.
- Establish well-defined boundaries around the vehicle using boundary markers (such as rope, tape, cones, etc.) to preserve evidence.
- Photograph the interior and exterior of the vehicle; including the vehicle identification number (VIN). Consider exterior photography from all four corners of the vehicle, towards the center of the vehicle.
- Collect DNA, fingerprint or trace evidence before moving the vehicle to avoid damaging or losing it when the vehicle is moved.
- Examine exterior surfaces for latent prints including the side mirrors, fenders (when a wheel is missing), and the six-inch-wide areas surrounding the sides, hood, trunk, and roof support post.
- Examine interior surfaces for latent prints including door handles, rear-view mirror, seat belt buckles, windows and window handles/buttons, stick shift knob, and glove box door.

□ Tow the vehicle to a well-covered, dry, secure area, such as a police compound, when a detailed search for evidence is required.

- Take steps to ensure that any evidence that can fall from the vehicle during towing can be retained; e.g., placing a tarp below the car or stabilizing bullet holes in glass with tape.

□ Maintain and continue to protect the boundary around the vehicle until it is towed. Documentation Record critical information about the vehicle before it is moved. Information to record in your notes includes:

- Odometer reading
- Gas level
- Apparent damage
- State of windows, head and tail lights, turn signal lights and mirrors
- Ambient temperature and radiator/hood temperature
- Possible reason for vehicle being at the location whenever appropriate, wrap all stray vehicle parts related to the vehicle in clean paper. Lay the object on the paper and fold the paper around it.

Marking evidence Evidence labeling:

Label the container for the object with your initials and identification number, the date and time, evidence number, location, and evidence description.

Evidence number:

Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence. Evidence description: The evidence description includes:

- Type of item
- Location of the item found
- The proximity of the item to the vehicle Label the container just before collecting an object, and seal the container immediately after collection.

Packaging

- a. Place the wrapped object into the labeled container. Some objects, such as tires, may be transported without placing into another container. If the object will not fit into a container, seal the paper wrapping the object with evidence tape.
- b. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.
- c. Seal the openings of the vehicle with evidence tape. It is important to seal the vehicle by taping exterior parts of the vehicle that can be opened with evidence tape.
- d. Avoid applying tape to areas that might be or are known to contain evidence that could be damaged when touched. When the weather is inclement, cover the necessary areas with a clean, weather-resistant material, such as plastic.
- e. The vehicle should be accompanied to a secured storage facility.
- f. When the vehicle arrives at its destination, sign the evidence log to verify that the vehicle was checked into the storage facility, then check that all seals on the vehicle are intact.
- g. When seals are broken, note when the break occurred and reapply evidence tape to secure the vehicle.

Electronic and Digital Evidence

Computers and other electronic devices are often found at crime scenes and may contain evidence of criminal wrongdoing.

This evidence includes:

- Media
- Networked computers
- Non-networked computers
- Wireless phones and tablet computers
- Other devices Procedure:

Loose media Electronic media

In this context, are objects on which digital data can be stored. They include storage media such as hard drives, compact disks (CDs), digital video disks (DVDs), “floppy” disks, audio and video cassette tapes, and USB flash drives.

They also include objects like smart cards (such as some credit cards) and memory cards such as Secure Digital (SD) cards, Mini or Micro SD cards, Compact Flash Cards, and xD cards. Common brand names are Kingston®, SanDisk® and Lexar®. Equipment Needed Anti-static bags, bubble-wrap and other packing materials; clean paper bags, boxes, or envelopes; evidence tape; flashlight;

waterproof pen; labels; personal protective equipment.

Precautions for seizing:

- Electronic evidence is fragile and sometimes includes time- sensitive data of investigative value that is stored on or transmitted by electronic devices.

- Handle electronic evidence carefully because it is fragile. It can be easily damaged by heat, cold, shock or magnetic fields.
- Do not handle contacts, bend connections, and expose media to extreme heat/cold or magnetic fields.
- Do not use destructive techniques, such as applying fingerprinting chemicals while collecting the electronic evidence.
- Do not try to view the contents of electronic evidence without assistance from a qualified analyst. Determine whether electronic media is present; it may or may not be associated with the visible computer or other electronic equipment, such as DVD or video player. Electronic media is small, can be easily hidden, and is sometimes camouflaged to appear as a non-electronic object. Use these methods to locate media:
 - Interview people at the scene or informants.
 - Examine monitors, keyboards, and mice for media slots.
 - Examine key rings, desk mat/pad, game machines (Xbox®, PS2™) and telephones for media.
 - Search vehicles, toys, cameras, TVs, and any personal electronic device.
 - Look for common types of media, such as DVDs, CDs, cassette tapes in drawers, boxes, closets.
 - Look for smart cards (card appearance is similar to a credit or ATM card), especially when different names are on several cards found together.
 - Examine desk areas completely for usernames, passwords, and email accounts.

Fulfill the legal requirements necessary for seizure of electronic media by contacting the appropriate authorities to obtain legal advice and warrants, as needed. To determine legal requirements, follow regulations while establishing whether there is probable cause to collect:

- Hardware
- Software
- Data
- Cell Phones Identify whether a warrant is needed or there is an exception to the warrant requirement. When the media is inside of a computer or other electronic component, do not remove it without the assistance of an electronic evidence collection expert. When the state of the computer or other electronic component is disturbed:
 - Data can be lost or damaged.
 - Files can be modified (e.g., creation dates/times).
 - The computer can be damaged.
 - Legitimate business can be disturbed.
 - Liability for officer and department can be created.

Documentation

When the media is readily accessible, document it as it was found before collecting it. Photograph the media as found using standard crime scene photographic techniques (overall, mid-range and close- up). Photograph all connections (network cables, power cables, and peripheral cables) to the device as you found them. Sketch a diagram of the placement of the media in the area

and relative to devices, equipment, and objects. Sketch and label the cable connections to the device prior to collection. Record information that supports the photograph, including:

- Type of media
- Media location
- Media appearance/condition, including visible damage or other characteristics
- Media storage capacity (e.g., SanDisk® 256MB) • Serial or other identifying numbers.

Marking Evidence Evidence labeling:

Prepare a label and apply it to the electronic media prior to packaging if practical. Include your initials and identification number, the date and time, evidence number, location and evidence description. Do not obscure serial numbers or manufacture's labels with the evidence label. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the numbered placard photographed and diagramed next to the evidence. Evidence description: The evidence description includes:

- Media type
- Media location
- Media appearance/condition, including visible damage or other characteristics
- Media storage capacity
- Serial or other identifying number Handle electronic evidence with care.

Do not use destructive techniques, such as applying fingerprinting chemicals, while collecting the electronic evidence. Do not expose electronic media to extreme heat, cold, or magnetic fields. Packaging

a. Package media to prevent the loss of data. Protect it from shock, bending, tearing, scratching and magnetic exposure. Use plastic bubble-wrap or foam pads as packing material when original packing materials are not available. Do NOT use Styrofoam as it creates static charges.

b. When the media requires fingerprinting, do not wrap it.

c. Place the media into the labeled container.

d. When transporting electronic media, attach a label indicating:

1. FRAGILE

2. SENSITIVE ELECTRONIC MEDIA

3. KEEP AWAY FROM MAGNETIC FIELDS

e. Close the container and completely seal the opening with evidence tape. Write your initials, identification number, and the time and date across the evidence tape seal.

f. Store electronic media in a secure area in a controlled climate away from magnetic sources, dust, and other contaminants.

g. Electronic media can be damaged when stored in areas where temperatures and humidity vary significantly.

Procedure:

Networked Computers

The seizure of networked computers presents unique challenges, always consult with a qualified computer forensic analyst or network administrator before shutting down and seizing a networked system. If possible, work with

the administrator of the system you are trying to seize. He/she will be the best resource to safely access and image media. Due to the size and complexity of modern computer networks, seizure is frequently not possible. Be prepared for extended time on site to logically or physically image media. When dealing with networked devices the amount of time it takes to secure the network and data is critical. By design many of these devices can be accessed from offsite and critical evidence can be remotely destroyed, copied, or encrypted.

Equipment Needed Hand truck; cable tags and ties; rubber bands; non-magnetic flat- blade and Philips-type screwdrivers; hex and Star-type nut drivers; needle-nose and standard pliers; secure-bit drivers; small tweezers; wire cutters; anti-static bags, bubble-wrap and other packing materials; packing tape; paper bags and sturdy boxes; magnifying glass; evidence tape; flashlight; printer paper; CDs and 3½-inch diskettes; mobile phone; waterproof pen; labels; personal protective equipment.

Electronic evidence is fragile and sometimes includes time- sensitive data of investigative value that is stored on or transmitted by electronic devices.

Handle electronic evidence carefully because it is fragile. It can be easily damaged by heat, cold, shock or magnetic fields.

Do not use destructive techniques, such as applying fingerprinting chemicals, before you examine the electronic evidence.

Federal and state laws regarding the interception of messages exist. State laws vary.

a. Contact an electronic evidence collection expert as soon as discovering computer equipment and related components (e.g., desktop or laptop computer,

printer, disk drive). Never move or alter the state of electronic hardware without first talking with an electronic evidence collection expert.

b. Look for proprietary software. Depending on the investigation, proprietary software such as database or financial software may have been used by the suspect. Seizure of the original software may be critical for the computer forensic analyst's investigation.

c. Fulfill the legal requirements necessary for network seizure by contacting the appropriate authorities to obtain legal advice and warrants, as needed.

d. To determine legal requirements, follow departmental regulations while establishing whether there is probable cause to collect:

- Hardware
- Software
- Data

e. Identify whether a warrant is needed or there is an exception to the warrant requirement.

f. Determine whether the computer equipment is stand-alone (i.e., not attached to a network) or attached to a network. Use these methods to locate a network:

- Interview people at the scene, or informants.
- Look for multiple computers in the area.
- Determine whether a printer is in the area.
- Look for cables or connectors linking a computer, card scanner, fax machine, etc., to each other, to a phone jack or phone, to a printer, etc.
- When a laptop is present, look for a network cable or a USB modem from a cell carrier's network (Verizon, ATT, Sprint) in a USB port.

- If no cables or USB modem are apparent and multiple devices are in the area, consider that a wireless network (WiFi) may be present. Work closely with an electronic evidence collection expert in this situation.

g. Establish whether the evidence will be processed on- or off-site and make the necessary arrangements. Determine whether components or data will be damaged or degraded if the network is moved.

h. Determine whether an outside electronic evidence collection expert is needed and available to:

- Remove the network components or provide instructions on how to remove them.

- Conduct the network and data investigation or provide instructions on how to do so.

i. Maintain the state of the computer components as found until after documentation is complete and after being directed to do otherwise.

j. Until there is an electronic evidence collection expert advising, do not disturb the network components. Whether the hardware was ON or OFF when found, leave it in that state. Never turn off power to the hardware (such as a computer, printer, phone) without:

- Being advised to do so by an electronic evidence collection expert.

- Following shutdown procedures for that piece of hardware (locate and use documentation when needed).

k. If it is determined that the device is running low on battery power, work with the expert to resolve this situation.

Documentation

- a. Document the state of the machine as it was found using photography, sketching, and note-taking.
- b. Photograph the screen, the back of the computer, and the connections to other equipment (e.g., printer, external drive).
- c. Sketch a diagram of the connections between the computer and other equipment.
- d. Record information that supports the diagram and photographs, including the state of the computer, existing connections, and:
 - Equipment type
 - Equipment location
 - Equipment appearance/condition, including visible damage or other characteristics
 - Serial numbers
- e. When preparing a computer for packaging, label the cable with the port and evidence numbers before removing the cable from the port.
- f. Starting in the upper left corner of the device, assign each port a number (e.g., Port 1). Write the port number and evidence number on a label or piece of tape and adhere it to the cable.
- g. Do the same for the other end of the cable. If the other end of the cable is plugged into the wall, indicate this.
- h. After each cable is removed from a port, label the port with the assigned port number.

Write the port number on a label or piece of tape. After the cable is removed from the port, place the label or tape over the port.

Marking Evidence Evidence labeling:

Place a label on each component that will be collected. Include your initials and identification number, the date and time, evidence number, and evidence description. Most often, only central processing units (CPUs) and the internal and external storage media (such as hard drives, CDs, or DVDs) are collected.

Evidence number: Each piece of evidence must have a unique number. This number should correspond to the numbered placard next to the evidence.

Evidence description: The evidence description includes:

- Equipment type
- Equipment location
- Equipment appearance/condition, including visible damage or other characteristics
- Serial number When a component is large, such as a monitor, and/or needs to be fingerprinted, only attach a tag directly to it unless the lead investigator provides the direction to place it in a transport container. When practical, wrap each component with anti-static or other protective material. Wrap items to protect them from physical damage and from loss of data due to magnetic exposure. When a component needs to be fingerprinted, do not wrap it.

Packaging

- a. Place the component into the labeled container.
- b. Package items to protect them from damage due to dropping or other physical impacts and from loss of data due to magnetic exposure:
- c. Use large, plastic bubble-wrap or foam pads as packing material when original packing materials are not available.



d. Do not use Styrofoam as it creates static charges. e. Protect internal storage from data loss (e.g., keep the CPU away from magnetic sources such as radios, heated seats, speakers).

f. CPUs and hard drives should be packaged to protect fingerprints and transported upright, in a position that prevents movement while traveling.

g. Monitors should be packaged and transported in a secure manner while protecting the screen and fingerprints. h. Close the container and completely seal the opening with evidence tape. Write your initials and identification number and the time and date across the evidence tape seal.

i. When transporting fragile computer components, label the outside of the transport container with handling instructions.

j. When transporting a CPU or hard drive, attach a label indicating: • THIS END UP • FRAGILE • SENSITIVE ELECTRONIC EQUIPMENT • KEEP AWAY FROM MAGNETIC FIELDS

k. Some data may be lost if battery power ceases while the related computer components are in storage. Inform the necessary personnel of computer components that rely on battery power so that they can be maintained. When seizing laptops, tablet computers, and other battery powered devices, make every effort to locate and seize the power cables for the device.

l. Store computer components in a secure area, in a controlled climate away from magnetic sources, dust, and other contaminants.

m. Computer components can be damaged when stored in areas where temperatures and humidity vary significantly.

Procedure:

Non-networked Computers Equipment Needed Hand truck; cable tags and ties; rubber bands; non-magnetic flat- blade and Philips-type screwdrivers; hex and Star-type nut drivers; needle-nose and standard pliers; secure-bit drivers; small tweezers; wire cutters; anti-static bags, bubble-wrap and other packing materials; packing tape; paper bags and sturdy boxes; magnifying glass; evidence tape; flashlight; printer paper; CDs and 3½-inch diskettes; mobile phone; waterproof pen; labels; personal protective equipment.

- Electronic evidence is fragile and sometimes includes time- sensitive data of investigative value that is stored on or transmitted by electronic devices.
- Handle electronic evidence carefully because it is fragile. It can be easily damaged by heat, cold, shock or magnetic fields.
- Do not use destructive techniques, such as applying fingerprinting chemicals, before you examine the electronic evidence.
- Federal and state laws regarding the interception of messages exist. State laws vary. a. Contact an electronic evidence collection expert as soon as discovering computer equipment and related components (e.g., desktop or laptop computer, printer, disk drive). Never move or alter the state of electronic hardware without first talking with an electronic evidence collection expert.
- b. Look for proprietary software. Depending on the investigation, proprietary software such as database or financial software may have been used by the suspect. Seizure of the original software may be critical for the computer forensic analyst's investigation.



c. Determine whether the computer equipment is stand-alone (i.e., not attached to a network) or attached to a network.

d. Use these methods to locate a network:

1. Interview people at the scene or informants.

2. Look for multiple computers in the area.

3. Determine whether a printer is in the area.

4. Look for cables or connectors linking a computer, card scanner, fax machine, etc., to each other, to a phone jack or phone, to a printer, etc.

5. When a laptop is present, look for a network cable or a USB modem from a cell carrier's network (Verizon, ATT, Sprint) in a USB port. 6. If no cables or USB modem are apparent and multiple devices are in the area, consider that a wireless network (WiFi) may be present. Work closely with an electronic evidence collection expert in this situation.

e. Fulfill the legal requirements necessary for seizure of the computer and related hardware and software by contacting the appropriate authorities to obtain legal advice and warrants, as needed.

f. To determine legal requirements, follow departmental regulations while establishing whether there is probable cause to collect:

- Hardware • Software

- Data g. Identify whether a warrant is needed or there is an exception to the warrant requirement. h. Establish whether the evidence will be processed on- or off-site and make the necessary arrangements. Determine whether components or data will be damaged or degraded if the computer is moved.

- i. Determine whether an outside electronic evidence collection expert is needed and available to:
- Remove the computer or provide instructions on how to remove it.
 - Conduct investigation of the computer and related components or provide instructions on how to do so.
- j. Maintain the state of the computer components as found until after documentation is complete and after being directed to do otherwise.
- k. Until there is an electronic evidence collection expert advising, do not disturb the network components. Whether the hardware was ON or OFF when found, leave it in that state. Never turn off power to the hardware (such as a computer, printer, phone) without:
- Being advised to do so by an electronic evidence collection expert.
 - Following shutdown procedures for that piece of hardware (locate and use documentation when needed).
- l. If it is determined that the device is running low on battery power, work with the expert to resolve this situation.

Documentation

- a. Document the state of the machine as it was found using photography, sketching, and note-taking.
- b. Photograph the screen, the back of the computer, and the connections to other equipment (e.g., printer, external drive).
- c. Sketch a diagram of the connections between the computer and other equipment.



d. Record information that supports the diagram and photographs, including the state of the computer, existing connections, and:

- Equipment type
- Equipment location
- Equipment appearance/condition, including visible damage or other characteristics
- Serial numbers e. When preparing a computer for packaging, label the cable(s) with the port and evidence numbers before removing the cable(s) from the port(s).
- Starting in the upper left corner of the device, assign each port a number (e.g., Port 1). Write the port number and evidence number on a label or piece of tape and adhere it to the cable.
 - Do the same for the other end of the cable(s). If the other end of the cable is plugged into the wall, indicate this.
 - After each cable is removed from a port, label the port with the assigned port number. Write the port number on a label or piece of tape. After the cable is removed from the port, place the label or tape over the port (see photo, next page).

Evidence Marking Evidence packaging:

Place a label on each component that will be collected. Include your initials and identification number, the date and time, evidence number, and evidence description. Most often, only central processing units (CPUs) and the internal and external storage media (such as hard drives, CDs, or DVDs) are collected. Evidence number: Each piece of evidence must have a unique number. This

number should correspond to the numbered placard next to the evidence.

Evidence description: The evidence description includes:

- Equipment type
- Equipment location
- Equipment appearance/condition, including visible damage or other characteristics
- Serial number Label a container for each component. Include your initials and identification number, the date and time, evidence number, and evidence description.

When a component is large, such as a monitor, and/or needs to be fingerprinted, only attach a tag directly to it unless the lead investigator provides the direction to place it in a transport container.

Whenever possible, use the original packing materials, including the fitted padding. Otherwise, use sturdy cardboard containers.

When practical, wrap each component with anti-static or other protective material. Wrap items to protect them from physical damage and from loss of data due to magnetic exposure. When a component needs to be fingerprinted, do not wrap it.

P a c k a g i n g

a. Place the component into the labeled container.

b. Package items to protect them from damage due to dropping or other physical impacts and from loss of data due to magnetic exposure:

Use large, plastic bubble-wrap or foam pads as packing material when original packing materials are not available.

- Do not use Styrofoam as it creates static charges.
- Protect internal storage from data loss (e.g., keep the CPU away from magnetic sources such as radios, heated seats, speakers).
- c. CPUs and hard drives should be packaged to protect fingerprints and transported upright, in a position that prevents movement while traveling.
- d. Monitors should be packaged and transported in a secure manner while protecting the screen and fingerprints.
- e. Close the container and completely seal the opening with evidence tape. Write your initials and identification number, and the time and date across the evidence tape seal.
- f. When transporting fragile computer components, label the outside of the transport container with handling instructions.
- g. When transporting a CPU or hard drive, attach a label indicating: • THIS END UP • FRAGILE • SENSITIVE ELECTRONIC EQUIPMENT • KEEP AWAY FROM MAGNETIC FIELDS.
- h. Some data may be lost if battery power ceases while the related computer components are in storage. Inform the necessary personnel of computer components that rely on battery power so that they can be maintained. When seizing laptops, tablet computers, and other battery powered devices, make every effort to locate and seize the power cables for the device.
- i. Store computer components in a secure area that is in a controlled climate away from magnetic sources, dust, and other contaminants.
- j. Computer components can be damaged when stored in areas where temperatures and humidity vary significantly. Procedure: Other Devices Other

devices include copy and facsimile (fax) machines, printers, scanners, bar coding machines, answering machines, digital cameras, GPS devices, etc. Equipment Needed Hand truck; cable tags and ties; rubber bands; non-magnetic flat- blade and Philips-type screwdrivers; hex and Star-type nut drivers; needle-nose and standard pliers; secure-bit drivers; small tweezers; wire cutters; anti-static bags, bubble-wrap and other packing materials; packing tape; paper bags and sturdy boxes; magnifying glass; evidence tape; flashlight; printer paper; CDs and 3½-inch diskettes; mobile phone; waterproof pen; labels; personal protective equipment.

- Electronic evidence is fragile and sometimes includes time- sensitive data of investigative value that is stored on or transmitted by electronic devices.
- Handle electronic evidence as latent evidence because frequently it is not readily visible without the aid of other equipment and/or software.
- Do not use destructive techniques, such as applying fingerprinting chemicals, before you examine the electronic evidence.
- Federal and state laws regarding the interception of messages exist. State laws vary.
 - a. Contact an electronic evidence collection expert as soon as the electronic device is discovered. Never move or alter the state of electronic hardware without first talking with an electronic evidence collection expert.
 - b. Fulfill the legal requirements necessary for seizure of the device by contacting the appropriate authorities to obtain legal advice and warrants, as needed.



c. To determine legal requirements, follow departmental regulations while establishing whether there is probable cause to collect:

- Hardware
- Software
- Data

d. Identify whether a warrant is needed or there is an exception to the warrant requirement. e. Determine whether the device is stand-alone (i.e., not attached to a network) or attached to a network. Use these methods to locate a network:

1. Interview people at the scene or informants.
2. Look for multiple computers in the area.
3. Determine whether a printer is in the area.
4. Look for cables or connectors linking a computer, card scanner, fax machine, etc., to each other, to a phone jack or phone, to a printer, etc.
5. If no cables are apparent and multiple devices are in the area, consider that a wireless network may be present. Work closely with an electronic evidence collection expert in this situation.

f. Establish whether the evidence will be processed on- or off-site and make the necessary arrangements. Determine whether the device or data will be damaged or degraded if the device is moved. Do not use destructive techniques, such as applying fingerprinting chemicals, before you examine the electronic evidence.

g. Determine whether an outside electronic evidence collection expert is needed and available to:

1. Remove the device or provide instructions on how to remove it.

2. Conduct the device and data investigation or provide instructions on how to do so.

h. Maintain the state of the device as found until after documentation is complete and after being directed to do otherwise.

i. Until there is an electronic evidence collection expert advising, do not disturb the network components. Whether the hardware was ON or OFF when found, leave it in that state. Never turn off power to the hardware (such as a fax or answering machine) without:

1. Being advised to do so by an electronic evidence collection expert.

2. Following shutdown procedures for that piece of hardware (locate and use documentation when needed).

j. If it is determined that the device is running low on battery power, work with the expert to resolve this situation.

Documentation

a. Document the state of the device as it was found using photography, sketching, and note-taking.

b. Photograph the screen, the back of the device, and connections to other equipment (e.g., camera with its lens cap and power cord nearby).

c. Sketch a diagram of the placement of the device in the area and connections to other devices, equipment, and objects.

d. Record information that supports the diagram and photographs, including the state of the device, any existing connections, and:

- Equipment type
- Equipment location

- Equipment appearance/condition, including visible damage or other characteristics
 - Serial or other identifying numbers
- e. When preparing a device for packaging, label the cable with the port and evidence numbers before removing the cable from the port.
- f. Starting in the upper left corner of the device, assign each port a number (e.g., Port 1). Write the port number and evidence number on a label or piece of tape and adhere it to the cable.
- g. Do the same for the other end of the cable. If the other end of the cable is plugged into the wall, indicate this.
- h. After each cable is removed from a port, label the port with the assigned port number, write the port number on a label or piece of tape. After the cable is removed from the port, place the label or tape over the port.

Marking Evidence Evidence Labeling:

Place a label on the device and any accompanying components such as battery chargers. Include your initials and identification number, the date and time, evidence number, and evidence description. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the numbered placard next to the evidence.

Evidence description:

The evidence description includes:

- Equipment type
- Equipment location

- Equipment appearance/condition, including visible damage or other characteristics
- Serial number Label a container for the device. Include your initials and identification number, the date and time, evidence number, and evidence description. When practical, wrap the device with anti-static or other protective material. Wrap items to protect them from physical damage and from loss of data due to magnetic exposure. When a device needs to be fingerprinted, do not wrap it.

Packaging

- a. Place the device into the labeled container.
- b. Package items to protect them from damage due to dropping or other physical impacts and from loss of data due to magnetic exposure:
 - Use large, plastic bubble-wrap or foam pads as packing material when original packing materials are not available.
 - Do not use Styrofoam as it creates static charges.
 - Protect internal storage from data loss (e.g., keep the CPU away from magnetic sources such as radios, heated seats, speakers).
- c. CPUs and hard drives should be packaged to protect fingerprints and transported upright, in a position that prevents movement while traveling.
- d. Monitors should be packaged and transported in a secure manner while protecting the screen and fingerprints.
- e. After placing the component into a container, close the container and completely seal the opening with evidence tape. Write your initials and identification number and the time and date across the evidence tape seal.

f. When transporting fragile electronic devices, label the outside of the transport container with handling instructions. Attach a label indicating:

- THIS END UP
- FRAGILE
- SENSITIVE ELECTRONIC EQUIPMENT
- KEEP AWAY FROM MAGNETIC FIELDS

g. Some data may be lost if battery power ceases while the related device is in storage. Inform the necessary personnel when the device relies on battery power so that they can maintain it.

h. Store the device in a secure area, in a controlled climate away from magnetic sources, dust, and other contaminants.

i. Electronic devices, such as cameras, copy, fax and answering machines, can be damaged when stored in areas where temperatures and humidity vary significantly. Procedure: Wireless Phones and Pagers 10,11 Wireless phones and pagers, in this context, include cellular phones; numeric, alphanumeric and two-way pagers; Personal Digital Assistants (PDAs); radio scanners; etc. Equipment Needed Faraday Bags , Anti-static bags, bubble-wrap and other packing materials; packing tape; paper bags and boxes; evidence tape; waterproof pen; labels; personal protective equipment.

☐ Phones, pagers, and PDAs are capable of receiving and storing information, such as text and voice messages, phone lists, memorandums, and caller identification and appointment information. ☐ Radio scanners can be powered by a cigarette lighter in a vehicle and by other common power sources. The

scanners can be used to monitor phone conversations, detect radar, and capture personal Internet or network information from afar.

□ GPS devices may store information on previous locations and searches conducted by the user.

□ Federal and state laws regarding the privacy of pagers and intercepting messages exist. State laws vary.

a. Fulfill the legal requirements necessary for seizure of the wireless phone or pager by contacting the appropriate authorities to obtain legal advice and warrants, as needed.

b. To determine legal requirements, follow departmental regulations while establishing whether there is probable cause to collect:

- Hardware
- Software
- Data

c. Identify whether a warrant is needed or there is an exception to the warrant requirement.

d. Maintain the state of the wireless phone or pager as found until after documentation is complete and after being directed to do otherwise.

e. Whether the device was ON or OFF when found, leave it in that state until advised by an electronic evidence collection expert. Never turn off a mobile phone or pager without:

- Being advised to do so by an electronic evidence collection expert.
- Following shutdown procedures (locate and use documentation when needed).

f. If it is determined that the wireless phone or pager is running low on battery power, work with the expert to resolve this situation.

DOCUMENTATION

a. Document the state of the wireless phone or pager as it was found using photography, sketching, and note-taking.

b. Photograph the screen, the back of the phone or pager, and other related equipment (e.g., battery charger regardless of whether phone is connected to the charger).

c. Sketch a diagram of the placement of the device in the area and relative to other devices, equipment, and objects.

d. Record information that supports the diagram and photographs, including the state of the wireless phone or pager, existing connections, and:

- Equipment type
- Equipment location
- Equipment appearance/condition, including visible damage or other characteristics
- Serial or other identifying numbers

e. Establish whether the evidence will be processed on- or off-site and make the necessary arrangements. Determine whether the device or data will be damaged or degraded if it is moved. Do not use destructive techniques, such as applying fingerprinting chemicals, before you examine the wireless phone or pager evidence.

f. Determine whether an outside electronic evidence collection expert is needed and available to:

- Examine the wireless phone or pager and related data.
- Provide instructions on how to do so.

Marking Evidence Evidence packaging:

When preparing a wireless phone or pager for packaging, label a container with your initials and identification number, the date and time, evidence number, and evidence description. Whenever possible, use the original packing materials, including the fitted padding. Otherwise, use sturdy cardboard containers. Retrieve and store power cables and adapters with recovered phones and pagers. It may be necessary to use the power cable or adapter for a device while the device is stored.

Evidence number: Each piece of evidence must have a unique number. This number should correspond to the numbered placard next to the evidence.

Evidence description:

The evidence description includes:

- Equipment type
- Equipment location
- Equipment appearance/condition, including visible damage or other characteristics
- Serial or other identifying number When practical, wrap the wireless phone or pager with anti-static or other protective material. Wrap items to protect them

from physical damage and from loss of data due to magnetic exposure. When a wireless phone or pager needs to be fingerprinted, do not wrap it.

Packaging

a. Place the wireless phone or pager into the labeled container. Wireless devices should be packaged in a Faraday bag or in a manner that prevents them from receiving incoming transmissions. Many devices have the ability to receive commands to delete all data or be remotely locked. One method of preventing incoming signals, if a Faraday bag is not available, is to place the device into “Airplane mode”.

b. Package items to protect them from damage due to dropping or other physical impacts and from loss of data due to magnetic exposure:

- Use large, plastic bubble-wrap or foam pads as packing material when original packing materials are not available.
- Do not use Styrofoam as it creates static charges.
- Protect internal storage from data loss (e.g., keep away from magnetic sources such as radios, heated seats, speakers).

c. Label the outside of the container with handling instructions.

d. When transporting electronic evidence, attach a label indicating:

- FRAGILE
- SENSITIVE ELECTRONIC EQUIPMENT
- KEEP AWAY FROM MAGNETIC FIELDS

- e. Some data may be lost if battery power ceases while the wireless phone or pager is in storage. Inform the necessary personnel of wireless phones or pagers that rely on battery power so that they can be maintained.
- f. Store the wireless phone or pager in a secure area, in a controlled climate away from magnetic sources, dust, and other contaminants.
- g. Electronic devices can be damaged when stored in areas where temperatures and humidity vary significantly.

FINGERPRINTS PROCESSING

Material for Fingerprints

The processing of items for fingerprints is done in accordance with the goals of the investigation. The prints should be obtained using accepted practices for that type of item, taking into consideration the weather conditions, substrate, matrix and nature of the case. The following procedures are addressed in this section:

- Procedure: Latent Fingerprints
 - Procedure: Patent (Visible) Fingerprints
 - Procedure: Chemical Processing Physical Processes: Latent Fingerprints
- Equipment Needed Fingerprinting kit (fingerprint powder, soft bristled brush, single-use brushes if chemical or biological contamination is possible, lifting tape, 8½" x 11" card stock papers); contact paper; envelopes; waterproof pen; evidence tape; ruler; identification labels; protective gloves; face protection.



Prints on evidence are fragile. The slightest amount of handling can degrade a print.

Whenever possible, collect the object on which you find prints.

Photograph the powdered print before collecting it.

Always use clean gloves when handling evidence.

Remember: Your prints and DNA may be transmitted by gloves when you touch anything, such as when you scratch your nose.

a. Identify the object that needs to be dusted.

- Smooth surfaces yield the best latent prints.

- When looking for latent prints, examine windows, mirrors, glasses, door handles, doors, etc.

b. Position the print powder, brush, and lifting tape within reach of the object.

- Use a powder color that contrasts with the background of the item from which the print is being collected.

- The color of the backing material must contrast with the color of the print powder used.

c. Gently brush the powder onto the object.

When available, follow manufacturer's development process instructions.

1. Pour a small amount of powder on a clean piece of paper or jar lid.

2. Lightly dip the brush into the powder.

3. Tap the brush lightly to cause excess powder to fall off of the brush onto the paper.

4. Carefully and gently brush the object being printed using curved strokes that follow the natural lines of the print.

Note: Don't ever blow on the surface since it can contaminate the surface with DNA. Documentation Endeavor to photograph the developed print. When photographing the developed print:

- Ensure that each photograph shows the scale and identification label.
- Always shoot location photographs as well as one-to-one/close-up photographs. Evidence Marking Evidence packaging: Label a lift card for the print with your initials and identification number, the date and time, evidence number, and evidence description. Record the information on the back of the card holding the lifted print. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence.

Evidence description:

The evidence description includes:

- Type of print being collected
- Location of the print
- Orientation of the print to north or to a prominent nearby object; e.g., "Fingerprints found on telephone receiver."
- A brief diagram of the location of the print on an object, depicted with an "x".

Lifting Fingerprints a. Remove a piece of lifting tape.

b. If a pre-made tape lift is being used, open the tape lift and remove the protective seal over the sticky part of the tape.

c. If contact paper is being used, remove the protective backing that covers the adhesive side of the paper.



d. Press the sticky side of the lifting tape to the developed print. Use firm but gentle pressure taking care not to smear the print.

e. Place the sticky side of the lifting tape onto the card stock. Protect the print by pressing the lifting tape to the card stock while taking care not to smear the print.

Packaging

a. Place the print lift in a container.

b. Multiple print lifts can be placed in the same container.

c. Submit all print lifts to the laboratory. Do not attempt to determine which lifts are suitable for comparison purposes.

d. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.

e. If printing a surface that may contaminate the fingerprint brush or powder with physiological fluids or controlled substances, do not use them on subsequent items until they have been decontaminated.

f. If possible, collect the item on which the print was found.

g. If the print is still moist, allow it to dry before collecting it.

h. When packaging an item with a developed print on it, be sure the transport container is made of paper and large enough to hold the item without damaging the print.

i. Place the item with the print, print side up, into the container while protecting the print from being touched.

Secure the item so that the print will not move or be disturbed during transport.

j. Seal the container with the evidence tape. Label the evidence tape. Procedure:

Patent (Visible)

Fingerprints Equipment Needed

Photography kit; flashlight and other available light sources; containers; waterproof pen; evidence tape; ruler; identification labels; protective gloves; face protection

Prints on evidence are fragile. The smallest amount of handling can degrade a print.

Always photograph the print before collecting it.

Always use clean gloves when handling evidence.

Your prints may be transmitted through your gloves when you touch anything, such as when you scratch your nose. Documentation Photograph the visible print. When photographing the print:

- Ensure that each photograph shows the scale and identification label.
- Always shoot location photographs as well as one-to-one/close-up photographs. Collection

- If possible, collect the item containing the visible print.

- If the print is still moist, allow it to dry before collecting it.

Packaging

a. Select a suitable container to transport the print. Make sure it is made of paper and is large enough to hold the item without damaging the print.

b. Place the item with the print on it, print side up, into the transport container while protecting the print from being touched.

c. Secure the item so that the print will not move or be disturbed during transport.

d. Seal the container with the evidence.

Label the evidence tape. Procedure:

Chemical Processing

Chemical processing is best performed in a laboratory or controlled environment. Chemical processing involves safety considerations since the chemicals used may constitute a hazard.

Chemical processing should only be performed by someone trained in the use of the process in the field. Some of the chemical processes available are listed in the table below:

Chemical Reagent Suitable Surfaces Ninhydrin (Caution: If ninhydrin is used at the crime scene, proper safety precautions must be taken. Solvents used in the preparation of ninhydrin can be

flammable or deplete oxygen.) Porous surfaces:

- Paper
- Wood
- Wall board Cyanoacrylate Ester or Super Glue Non-porous surfaces:
- Glass
- Metal
- Semi-porous surfaces (e.g., glossy or coated) Small particle reagent
- Wet surfaces Crystal Violet
- Sticky side of adhesive tapes Sudan Black
- Plastic baggies

- Coated drinking cups and plates
- Food stuff–contaminated non- and semi-porous items
- Cyanoacrylate ester– processed items Amido Black, Leuco-Crystal Violet, DAB, etc.
- Blood-contaminated impressions

Latent prints can also be enhanced by use of a forensic light source in combination with the following processing chemicals and powders:

- DFO
- Indanedione
- Rodamine 6G, RAM, Basic Yellow, etc.
- Redwop, Greenwop

Comparison/Elimination Prints Procedure: Inked Prints Equipment Needed Fingerprinting kit (fingerprint ink pads, fingerprint cards, fingerprint card holders); ink remover towels or waterless hand cleaner; envelopes; waterproof pen; identification labels; protective gloves

Coordinate with the Medical Examiner or Coroner before attempting to collect prints from a deceased person. Protect a deceased person's hands and feet by covering them with paper bags that are secured at the victim's wrist and ankle. Never use plastic bags to protect these areas of a body.

Elimination prints can be collected after evidence collection has occurred.

The preferred method for collecting comparison/elimination prints is using ink.

Finger, palm, hand, toe, heel, feet, and major case prints can be inked and rolled.



- Always use clean gloves when handling evidence.
- a. Before collecting prints, ensure that the hands are photographed to document any trace material or physiological fluid which may be present, and collect the material before proceeding.
- b. Set up the location where prints will be taken, preferably on a flat surface. Ensure that fingerprint supplies are easily accessible and ready for use.
- c. Instruct the person to clean their hands before rolling the prints if applicable.
- d. Complete as much of the information requested on the print card as possible. Critical information includes your name and identification number, the name of the fingerprinted person, the date and time, and which hand was printed.
- e. Insert the print card into a card holder.
- f. Position the person being printed so that the hands are easily accessible to you without your firearm side being exposed, if you are wearing a firearm.
- g. Just before rolling prints, put on clean gloves to ensure that you have eliminated the possibility of transferring your prints to the card.
- h. The person being printed should stand facing the print card. You can stand, being sure to safeguard your firearm if you are wearing one, to the side of the hand being printed or in front of the person.
- i. Hold the person's thumb tip and wrist gently, and press the thumb onto the ink strip. Roll the thumb on the ink from the edge of the nail on one side to the edge of the nail on the other side.
- j. Be sure to ink the tip of the thumb (or finger) well so that the developed print is as clear and complete as possible.

- k. Gently and with steady force, press the inked thumb to the card and roll it from the edge of the nail on one side to the edge of the nail on the other side.
- l. Repeat the inking and rolling process for all fingers on one hand, starting with the index finger. Print the fingers in this order: index, middle, ring, and little.
- m. When a print is smudged or otherwise defective on the card, take another print on a new card for that finger only. Label the card so that it clearly corresponds with the card containing the smudged print. Never discard a print card; do not cover the print with a fingerprint tab designed for this purpose.
- n. When print impressions are not clear due to a skin condition or other circumstance, write “Best print possible due to (reason)” in the space nearest the print on the card.
- o. When a finger is injured or missing, note the condition in the space for that finger.
- p. When necessary, obtain a new card for the prints from the other hand. When using a ten print card, use the space provided for the other hand.
- q. Package to protect the completed card. Procedure: Flexible Lifter Equipment Needed Fingerprinting kit (fingerprint powder, soft bristled brush); flexible plastic lifters (e.g., Handiprint©, Kinderprint©); fingertip moistener; waterless hand cleaner; envelopes; waterproof pen; protective gloves.
- Coordinate with the Medical Examiner or Coroner before attempting to collect prints.
 - Protect a dead victim’s hands and feet by covering them with paper bags that are secured at the victim’s wrist and ankle.
 - Elimination prints can be collected after evidence collection has occurred.

- Finger, palm, hand, toe, heel, and feet prints, and major case prints can also be developed using this method.
- Always use clean gloves when handling evidence.
 - a. Prepare to take the prints by setting up the location where prints will be taken and instructing the person to clean their hands if they are very soiled.
 - b. Before collecting prints, ensure that the hands are photographed to document any trace material or physiological fluid which may be present, and collect the material before proceeding.
 - c. Complete as much of the information requested on the print card as possible. Critical information includes your name and identification number, the name of the fingerprinted person, the date and time, and which hand was printed.
 - d. Avoid touching the lifter in the area where the person's prints will be developed.
 - e. Cut a sheet of flexible plastic lifter into 1½" x 8" strips to record fingers.
 - f. Rub a small amount of fingertip moistener onto the subject's fingers. Any excess may be wiped off with a paper towel.
 - g. Lightly dust palm side of hand with black fingerprint powder.
 - h. Separate release paper from flexible plastic lifter.
 - i. Spread fingers and press hand on adhesive side of lifter.
 - j. Lift hand. Press the lifter along the length of each finger, and around the sides of the fingertips.
 - k. Press around thumb as much as possible.
 - l. Larger pieces of lifter can be used to capture palm detail.

- m. Prepare a backing material, such as clear acetate, and cover the adhesive side of the lifter with the acetate. Write identifying information on the back of the lifter.
- n. Trim and add to a tenprint fingerprint card, if applicable.
- o. When print impressions are not clear due to a skin condition or other circumstance, write “Best print possible due to (reason).” in the space nearest the print on the card.
- p. When a thumb or finger is injured or missing, note the condition of the thumb or finger in the space for the print.
- q. Repeat the rolling and dusting process to collect the thumb and fingerprints from the person’s other hand.
- r. Place the print cards in the container.

Tool Mark Evidence

A tool mark is any impression, scratch, gouge, cut, or abrasion made when a tool is brought into contact with an item, leaving an impression of the tool. In some cases, tool mark identification may link a person to the tool used in the commission of a crime. Equipment Needed Casting kit (e.g., Duplicast™, Mikrosil™, silicone-type sealant); mixing pad; stirring stick; flashlight and other available light sources; paper envelopes and boxes; waterproof pen; measuring tape/ruler; identification labels; protective gloves; face protection.

- Photograph the impression before casting it.
- When making a cast, be prepared to act quickly and methodically. Time is often a critical factor in successfully making a cast.
- Always use clean gloves when handling evidence.

D o c u m e n t a t i o n P h o t o g r a p h t h e i m p r e s s i o n .

When photographing the object:

- Include a scale and an identification label.
- Take one or more location photographs that show the object where it was found.
- Show the relationship of the object to other evidence in the photograph.

Evidence Marking Evidence labeling: Label a container for the object with your initials and identification number, the date and time, evidence number, location, and evidence description. Evidence number: Each piece of evidence must have a unique number. This number should correspond to the placard next to the evidence.

Evidence description:

The evidence description includes:

- Type of item being cast
- Location of the item being cast
- Orientation of the item being cast to north, to a feature of the object with the impression on it, or to a nearby object.

Casting the Evidence

- a. Label the container just before collecting an object, and seal the container immediately after collection.
- b. Clean out loose material from the impression, when possible, without disturbing the impression. Never discard a cast, regardless of condition when

removed from the impression. Be sure to save and submit all casts to the laboratory. Packaging

a. Close the container and seal the entire opening with evidence tape. Write your initials and identification number, and the date and time across the evidence tape seal.

b. Make sure that the container is also labeled with a description of the item cast, your initials and identification number, the date and time, location and, when possible, the evidence number.

c. If the item with the tool mark is collected, it should be packaged to prevent any additional marks, impressions or other damage. Never place the suspected item into the impression. Summary: Evidence at crime scenes that is in the process of documentation, collection, preservation, or packaging should be handled with attention to scene integrity and protection from contamination or deleterious change. During the processing of the scene, and following documentation, evidence should be appropriately packaged, labeled, and maintained in a secure, temporary manner until final packaging and submission to a secured evidence storage facility or the crime laboratory.

Completing and Recording the Crime Scene Investigation

1. Establish Crime Scene Debriefing Team

Principle:

The crime scene debriefing enables law enforcement personnel and other responders to share information regarding particular scene findings prior to releasing the scene. It provides an opportunity for input regarding follow-up investigation, special requests for assistance, and the establishment of post-scene responsibilities.

Policy: Law enforcement personnel and other responders shall participate in or initiate a crime scene debriefing to ensure the crime scene investigation is complete and to verify post-scene responsibilities.

Procedure: The investigator(s) in charge of the crime scene should establish a crime scene debriefing team. When participating in a scene debriefing, law enforcement personnel and other responders should:

- a. Establish a crime scene debriefing team, which includes the investigator(s) in charge of the crime scene, other investigators and evidence collection personnel (e.g., photographers, evidence technicians, latent print personnel, specialized personnel, and initial responding officer(s) if still present).
- b. Determine what evidence was collected.
- c. Discuss preliminary scene findings with team members.
- d. Discuss potential technical forensic testing and the sequence of tests to be performed.
- e. Initiate any action(s) identified in discussion that are required to complete the crime scene investigation.
- f. Brief person(s) in charge upon completion of assigned crime scene tasks.
- g. Establish post-scene responsibilities for law enforcement personnel and other responders.

Summary: The crime scene debriefing is the best opportunity for law enforcement personnel and other responders to ensure that the crime scene investigation is complete.

2. Perform Final Survey of the Crime Scene

Principle:

Final survey of the crime scene ensures that evidence has been collected and the scene has been processed prior to release. In addition, a systematic review of the scene ensures that evidence,

equipment, or materials generated by the investigation are not inadvertently left behind and any dangerous materials or conditions have been reported and addressed. Policy: The investigator(s) in charge shall direct a walk - through at the conclusion of the scene investigation and ensure that the scene investigation is complete. Procedure: The investigator(s) in charge should ensure that: a.

Each area identified as part of the crime scene is visually inspected.

b. All evidence collected at the scene is accounted for.

c. All equipment and materials generated by the investigation are removed.

d. Any dangerous materials or conditions are reported and addressed.

e. The crime scene is released in accordance with jurisdictional requirements.

f. Consider taking photographs depicting the condition of the scene at the time.

Summary: Conducting a scene walk-through ensures that all evidence has been collected, that materials are not inadvertently left behind, and that any dangerous materials or conditions have been reported and addressed.

3. Documentation of the Crime Scene

Principle: Compiling reports and other documentation pertaining to the crime scene investigation into a “case file” provides a record of the actions taken and evidence collected at the scene. This documentation allows for independent review of the work conducted. Policy: The investigator(s) in charge shall ensure that reports and other documentation pertaining to the crime scene investigation are compiled. Procedure: The investigator(s) in charge should obtain the following for the crime scene case file:

- a. Initial responding officer(s’) documentation.
- b. Emergency medical personnel documents.
- c. Entry/exit documentation. d. Photographs/videos.
- e. Crime scene sketches/diagrams.
- f. Evidence documentation.
- g. Other responders’ documentation.
- h. Record of consent form or search warrant.
- i. Reports such as forensic/technical reports, when they become available.

Note: The above list is limited to crime scene documentation. This should not be considered a comprehensive list of the documents involved in an investigative case file. Summary: This procedure will ensure that reports and other documentation pertaining to the crime scene investigation are compiled into a case file by the investigator(s) in charge of the crime scene and allow for independent review of the work conducted.

4. Acknowledge Specialized Crime Scene Circumstances

Principle: While all crime scene investigations pose their individual complexities, some situations may involve atypical crime scene locations or requirements for which Law enforcement personnel and other responders should be aware.

Policy: Law enforcement personnel and other responders shall vigilantly prepare for crime scene investigations under specialized crime scene circumstances.

Procedure: Crime scene investigators should adjust their approach to an investigation to warrant specific needs of the investigation which includes:

- Crime Scenes in correctional and custodial facilities
- Crime scenes in which the safety of the crime scene investigators must be considered in the approach to the time spent at the scene

Crime Scene Investigation in Correctional and Custodial Facilities

Investigations conducted in correctional and custodial facilities require significant awareness on the part of the crime scene investigator. Using the appropriate search methodology is key to a thorough investigation. Additional guidance is provided if the focus of the search is a place of confinement, e.g., a cell.

- a. Use a search method appropriate for the size of the area of confinement.
- b. Consider that evidence could exist or be placed at higher levels than is typical in a crime scene. Make sure you look up.

c. Consider that some evidence may be deliberately covered up. Move layers of material, looking for potential evidence underneath.

d. Move material aside and search. In cells, this includes:

- bedding material
- bedding frames
- lamps
- air grates
- plumbing and chases
- cell bar attachments, such as to walls
- trash receptacles

e. Carefully examine materials encountered.

Even an item such as a pen can be modified to be a weapon. Assume nothing is as it first appears.

f. Have custodial staff advise if anything appears different or out of place for their facility.

Time-Limited Crime Scene Investigation

In some instances, deteriorating security or environmental conditions limit the amount of time available for the investigation of the crime scene. While these time limits will not allow for a thorough crime scene investigation to be conducted, the following procedure will maximize the use of the limited time onsite. In such circumstances, preparation prior to staging or entry into the crime scene area is paramount. This could include a site survey (e.g., in-person, photographic, photogrammetric or videographic) prior to the team's arrival at the scene or conducting extensive interviews of any witnesses from the area.

Elements of this preparation and execution are designed to:

- a. Determine the time available to remain at the crime scene based upon best knowledge of time-limiting factors.
- b. Determine the most critical objective of being on the site of the investigation; e.g., removal of a deceased body, identification of suspect, collection of explosive residue, etc.
- c. Determine the equipment needed to fulfill the objective. Pre- package from established crime scene collection kits a ready-kit for this specific event.
- d. Determine any specialized personnel that may be needed on- scene for this investigation.
- e. Develop a documentation and collection plan to include:
 - Type and nature of documentation expected
 - Priority of evidence collection
 - Responsibility for onsite collection
 - Responsibility for evidence custody

Crime scene investigation in specialized circumstances requires the application of techniques that have been adapted for unusual conditions.

Crime Scene Equipment

1. Initial Responding Officer(s)

Essential*

- Consent/search forms.
- Crime scene barricade tape.
- First-aid kit.
- Flares.
- Flashlight and extra batteries.

- Paper bags.
- Personal protective equipment (PPE)

* These items should be in police vehicles or readily available to initial responding officer(s).

Optional

- Audiotape recorder
- Camera with flash and extra film, if not digital camera
- Chalk
- Directional marker/compass
- Disinfectant (such as a 10% bleach solution)
- Maps • Plastic bags
- Pocket knife
- Reflective vest
- Tape measure
- Tarps to protect evidence from the weather
- Traffic cones
- Waterless hand wash (towelette with germicide)
- Wireless phone

2. Crime Scene Investigator/Evidence Technician

Essential*

- Bindle paper
- Biohazard bags
- Body fluid collection kit

- Camera with flash and tripod; extra film, if not digital; extra flash memory cards, if digital
- Casting materials
- Consent/search forms
- Crime scene barricade tape
- Cutting instruments (knives, box cutter, scalpel, scissors, etc.)
- Directional marker/compass
- Disinfectant (such as a 10% bleach solution)
- Evidence collection containers including rigid containers for firearms and ammunition boxes, pie boxes with sheet cotton for document recovery; manila folders
- Evidence identifiers (numbers, placards)
- Evidence seals/tape
- First-aid kit
- Flashlight and extra batteries
- High-intensity lights
- Latent print kit
- Magnifying glass
- Measuring devices
- Permanent markers
- Personal protective equipment (PPE)
- Photographic scale (ruler)
- Presumptive blood test supplies
- Sketch paper



- Tool kit
- Tweezers/forceps
- Window screen fabric in rolls or sheets

* These items should be in vehicles or readily available to Crime Scene Investigator/Evidence Technician.

Optional

- Audiotape recorder
- Bloodstain pattern examination kit
- Business cards
- Chalk
- Chemical enhancement supplies
- Compass
- Entomology (insect) collection kit
- Extension cords
- Flares
- Forensic light source (alternate light source, UV lamp/laser, goggles)
- Generator • Gunshot residue kit
- Laser trajectory kit
- Maps
- Marking paint/snow wax
- Metal detector
- Mirror
- Phone listing (important numbers)
- Privacy screens

- Protrusion rod set
- Reflective vest
- Refrigeration or cooling unit
- Respirators with filters
- Roll of string.
- Rubber bands.
- Sexual assault evidence collection kit (victim and suspect)
- Shoe print lifting equipment
- Templates (scene and human)
- Thermometer
- Traffic cones
- Trajectory rods
- Video recorder
- Wireless phone

3. Evidence Collection Kits (Examples)

Blood Collection

- Bindle
- Coin envelopes
- Disposable scalpels
- Distilled water or single use sterile water droppers
- Evidence identifiers
- Drying box
- Latex gloves
- Photographic ruler (ABFO scales)
- Presumptive chemicals

- Swabs Fingerprint
- Adhesive and gelatin lifting materials
- Brushes
- Chemical enhancement supplies
- Cyanoacrylate (super glue) wand/ packets
- Fingerprint ink pads, cards and card holders for exemplar collection
- Flashlight
- Forensic light source
- Lift cards, including 8 ½” x 11” card stock
- Lift tape
- Measurement scales
- Powders Bloodstain Pattern Documentation
- ABFO scales
- Calculator
- Laser pointer
- Permanent markers
- Protractor
- String
- Tape

Electronic and Digital Evidence Recovery

- Anti-static bags
- Bubble-wrap and other packing materials
- Cable tags and ties
- CDs and 3½-inch diskettes
- Faraday Bags

- Hand truck
- Nut drivers, hex and star-type
- Pliers: needle-nose and standard
- Rubber bands
- Magnifying glass
- Printer paper
- Secure-bit drivers
- Screwdrivers, non-magnetic flat-blade and Philips-type
- Tweezers, small non-magnetic
- Wire cutters Excavation and Evidence Recovery
- Cones/markers
- Evidence identifiers
- Hand tools (hammer, chisel/screwdriver, forceps, hand saw, box cutter, drywall saw, etc.)
- Metal detectors
- Paintbrushes
- Shovels/trowels
- Sifting screens
- String
- Weights
- Wooden/metal stakes Impressions – footwear, tire tracks and tool mark
- Bowls/mixing containers
- Boxes
- Casting Kit (e.g. Duplicast©, Mikrosil© or polyvinylsiloxane (PVS) materials, silicone-type sealant)



- Dental stone
- Evidence identifiers
- Material for forms
- Measurement scales
- Permanent markers
- Snow print wax
- Stirring sticks
- Water Pattern Print Lifter
- Chemical enhancement supplies
- Electrostatic dust lifter
- Gel lifter
- Wide format lift tape Trace Evidence Collection
- Acetate sheet protectors or clear secondary liners
- Bindle paper or weigh paper for bindles
- Butcher paper
- Clear packing/sealing tape 2 ½- to 4 inches wide
- Cotton-tipped swab
- Flashlight (oblique lighting)
 - Forceps/tweezers (disposable or clean smooth tipped)
- Glass jars, bottles, vials with air-tight, screw-on lids
 - Metal friction lid cans with fitting lids
 - Slides and slide mailers
- Trace evidence vacuum with disposable collection filters
- Transfer pipettes (glass or plastic)

CHAPTER FOURTEEN



CRIMINAL DEFENCE INVESTIGATIONS

Much is written regarding the career opportunities associated with criminology, especially those in subspecialty areas such as law enforcement and the forensic sciences. In fact, most of the criminology literature has focused on the roles of government agencies providing services as part of, or on behalf of, the prosecution. Additionally, a dramatically exaggerated role of law enforcement associated crime investigation has been promoted in books, film, and television, both currently and historically. The continued stream

Criminal Defense Investigator (CDI): An individual who performs investigative services for agencies, attorneys, or private clients on their behalf, outside the subordination of law enforcement. **Guilt Phase:** The first phase of any trial, including those involving the death penalty, in which the jury decides whether the accused committed the crime and whether the special circumstances for capital murder have been met. **Mitigating Evidence:** Any evidence that might provide a reason or rationale for a lighter sentence, including the defendant's character, upbringing, mental status, or circumstances of the crime. Most commonly a feature of death penalty cases because of the legal requirement to treat each defendant as a unique individual with respect

punishment for the crime that has been committed. Mitigation Specialist: A social and psychological biographer of the defendant who investigates, analyzes, and evaluates the life history of the defendant. Penalty Phase: The second phase of a death penalty trial in which there is a separate jury vote to determine the ultimate sentence in this case, be it death or life without the possibility of parole. Key terms of this programming into popular culture, along with the selective nature of the criminology literature, has narrowed the perspective of educational programs and students alike. Colleges and universities teach criminology and criminal justice from a pro-law enforcement and pro-prosecution perspective. They tend to hire educators who perpetuate that view, and students are left without any sense of the careers available in private investigation, let alone that they are valid and necessary components of the criminal justice system. The result of the current educational and adversarial climate is that criminal defense investigation is generally not taught at university as is police investigation, and that criminal defense investigators tend to be unacknowledged in a legitimate professional sense. The purpose of this chapter is to help correct that oversight; to educate readers regarding the nature and role of criminal defense investigations. Primarily that they exist, who performs them, and how they make a necessary set of contributions to the criminal justice system.

The Criminal Defense Investigator Criminal defense investigators (CDIs) perform investigative services for agencies, attorneys, or private clients on their behalf. This work is done outside the sub-ordination of law enforcement. Most often their cases involve criminal allegations or charges that have been

brought, or may be brought, against a particular individual (e.g., defendants or suspects). There are investigators in civil litigation as well; however, that subspecialty of private investigations is beyond the focus of this effort. This chapter is intended to provide criminology students and professionals with a sense of what criminal defense investigators are, what they do, and why any of it matters. There is probably no investigative endeavor that is more misunderstood by the general public than the function of criminal defense investigators. All too often, their role is reduced to the ignorant and false accusation that they are “trying to help get the defendant off.” It is true that the CDI works for defense attorneys who are ethically bound to vigorously defend their clients and challenge the state’s case. However, ethical CDIs are just as dedicated to uncovering fact and truth as their law enforcement counterparts. And, like police investigators, they are not in charge of deciding what happens in court. As the blind scales of justice indicate, law and society require objective balance—the prosecution on one side and the defense on the other. If one becomes too powerful, the system becomes unbalanced, and justice for all will suffer. Criminal defense investigators are an important component with respect to maintaining this balance. In the United States in particular, their role has a strong historical foundation rooted in the ideals that Uganda ought to exemplify.

A case for Uganda lessons for comparative analysis with United states of America

Consider these excerpts from the Constitution of the United States (1787) with its Bill of Rights.

Amendment 4

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Amendment 5

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

Amendment 6

In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall

have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the Assistance of Counsel for his defence.

The 14th amendment:

...No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws. There are, of course, other assurances in the U.S. Constitution besides these. However, it is apparent that the founding fathers specifically intended to protect the rights of those accused of committing crimes. This originated from a healthy fear of suffering abuses at the hands of the State and its less than scrupulous agents. In 1963, the U.S. Supreme Court held in *Gideon v. Wainwright* that the right to counsel by an indigent defendant extended to all criminal proceedings, not just capital cases. Being poor should not be a factor in whether or not a defendant gets effective representation by counsel. Gideon was charged with breaking and entering in the state of Florida. He was indigent at the time and could not afford to hire a lawyer. He petitioned the court to have an attorney appointed for him at the court's expense; however, he was denied. Gideon was forced to represent himself in the criminal proceedings. He was convicted and sentenced to five years in prison. After a number of appeals, his case made its way to the United

States Supreme Court. Upon review of the case, the Supreme Court decided unani- mously that the United States Constitution 6th Amendment’s guarantee to coun- sel was a fundamental right and essential to a fair trial. This right was extended to the states through the Due Process Clause of the 14th Amendment. This right was nothing new at the federal level. However, in the advent of the civil rights movement in the 1960s, the U.S. Constitution was being forced upon many of the states under the provisions of the 14th Amendment. A state’s own statutes must guarantee the minimum rights to the individual afforded by the U.S. Constitution, but not all states eagerly abide. Gideon lays the groundwork for the role of the criminal defense investigator as court-appointed defense counsel requires the services of defense investigators to research and adequately prepare a defense case. In more recent history, the U.S. Supreme Court has held (*Herring v. New York*, 1975):

The very premise of our adversary system of criminal justice is that partisan advocacy on both sides of a case will best promote the ultimate objective that the guilty be convicted and the innocent go free. This is rooted in the 6th Amendment, which guarantees that every criminal defendant be provided with “assistance of counsel” when preparing and pre- senting a defense. Subsequent to *Herring*, the U.S. Supreme Court further described the effectiveness of this counsel in a pair of landmark opinions requiring that a criminal defendant must receive “assistance of counsel” and that such assistance must be “effective” [See *US v. Cronin* (1984); *Strickland v. Washington* (1984)]. In April of 2004, the Supreme Court of the State of South Carolina succinctly described the

functional role of these decisions in the investigation and representation of a criminal defendant (Nance v. Frederick, 2004):

In *Cronic*, the Court characterized the protection that the Sixth Amendment affords the defendant:

The right to the effective assistance of counsel is thus the right of the accused to require the prosecution's case to survive the crucible of meaningful adversarial testing. When a true adversarial criminal trial has been conducted—even if defense counsel may have made demonstrable errors—the kind of testing envisioned by the Sixth Amendment has occurred. But if the process loses its character as a confrontation between adversaries, the constitutional guarantee is violated. As Judge Wyzanski has written: “While a criminal trial is not a game in which the participants are expected to enter the ring with a near match in skills, neither is it a sacrifice of unarmed prisoners to gladiators.”

And further:

In *Strickland*, the Court set forth a two-part test for evaluating the effectiveness of the criminal defendant's attorney. To receive a new trial on the grounds of ineffectiveness of counsel, the petitioner must prove (1) that his counsel's representation was deficient, and (2) that there is a reasonable probability that counsel's deficient conduct prejudiced the outcome of petitioner's trial.

In their continued analysis of these issues in *Nance*, the Court found that (Nance v. Frederick, 2004):

The Court stated in *Cronic* that there are three circumstances in which the defendant's representation is so inadequate that the second element of the

Strickland test, the prejudice element, can be presumed. *Cronic*, 466 U.S. at 658–659, 104 S. Ct. at 2039.

The first scenario in which prejudice is presumed is when there is a “complete denial of counsel,” which occurs when a trial is rendered unfair because the defendant is denied assistance of counsel during a “critical stage” of his trial.

Id.

In the second scenario, prejudice is presumed if “counsel entirely fails to subject the prosecution’s case to a meaningful adversarial testing.” When there has been no meaningful adversarial testing, then “the adversary process itself [is] presumptively unreliable.” *Id.* In *Bell v. Cone*, the U.S. Supreme Court explained further that “the attorney’s failure [to test the prosecutor’s case] must be complete” for this standard to be met. T. 535 U.S. 685, 697, 122 S. Ct. 1843, 1851, 152 L. Ed. 2d 914 (2002).

Third, prejudice is presumed when circumstances dictate that no attorney could render effective assistance of counsel. *Cronic*, 466 U.S. at 659–662, 104 S. Ct. at 2047–2048.

Given the language afforded in the U.S. Constitution, and the continued support of the U.S. Supreme Court, the role of the criminal defense investigator is important for the effective administration of justice. Defendants are entitled to defend themselves when accused of crimes by the state. To do this, they need effective assistance of counsel and the ability to investigate the charges against them. Despite this reality, criminal defense investigators are rarely held in the same esteem by the courts, or the public, as sworn police officers or federal

agents. However, their investigative roles are equally important and a deficit in efforts on either side of the courtroom places justice in a state of imbalance.

the role of the CDI Keeping in mind the requirements for effective counsel already mentioned, there must also be effective investigation. Criminal investigation does not end with the arrest of a suspect or even with the conviction of a defendant. In fact, each of these events signals a new investigative beginning. In this context, the CDI is ultimately responsible for the reinvestigation of the case that is presented by the state against a defendant. This includes the reinterviewing all key witnesses and reviewing all police reports, crime lab reports, physical evidence, witness statements and statements made by the defendant to police and others. There is, additionally, a never-ending quest for evidence that is being withheld by the state from the defense. As explained in Ciolino (2005, p. 14):

The first order of business in any old case is to assemble, locate, and organize all available discovery [a.k.a. disclosure] materials. This is much easier said than done. Often it turns into a full time job that will continue throughout your involvement in any specific case. It is a maddening, frustrating, and never-ending quest. But, at the end of the day, it must be accomplished. Though describing “old” cases, or those inherited from other attorneys and investigators, this advice rings true for new cases as well. Getting the state’s evidence assembled and organized must be a priority. Again, this is all done to identify and test the strength of evidence and theories that implicate the defendant. It also provides a foundation for the generation of alternate theories to explain that evidence, when feasible. This is the role of the CDI. No matter

what the case, an attorney cannot adequately represent a criminal defendant without some minimal investigative support. In some instances, that may simply involve an investigator being present to corroborate an interview by an attorney who is talking to witnesses. Because an attorney can't actually be a witness in his or her own cases, it is often necessary to have an independent witness (the investigator) to important events. The CDI can testify about what was observed in the event that a witness changes his or her story after speaking with police, after speaking with prosecutors, or after taking the stand. The more complex case, the more such tasks will be delegated to the CDI.

In 1995, the National Legal Aid and Defender Association published its Performance Guidelines for Criminal Defense Representation (NLADA, 1995). These guidelines are the framework constituting the basic "standards of practice" for defense counsel. The criminal defense investigator is a key figure in counsel's compliance to these guidelines. Note that when the word counsel is used, one can assume it to mean counsel and/or his or her investigator. The attorney has the responsibility to see that things get done, but the investigator is often the one who does all or part of the work to accomplish key tasks. The following was taken from NLADA (1995):

Guideline 4.1 Investigation

Counsel has a duty to conduct an independent investigation regardless of the accused's admissions or statements to the lawyer of facts constituting guilt. The investigation should be conducted as promptly as possible.

Sources of investigative information may include the following:

Charging documents: Copies of all charging documents in the case should be obtained and examined to determine the specific charges that have been brought against the accused. The relevant statutes and precedents should be examined to identify: the elements of the offense(s) with which the accused is charged; the defenses, ordinary and affirmative, that may be available; any defects in the charging documents, constitutional or otherwise, such as statute of limitations or double jeopardy.

The accused if not previously conducted, an in-depth interview of the client should be conducted as soon as possible and appropriate after appointment or retention of counsel. The interview with the client should be used to: seek information concerning the incident or events giving rise to the charge(s) or improper police investigative practices or prosecutorial conduct which affects the client's rights; explore the existence of other potential sources of information relating to the offense; collect information relevant to sentencing.

Potential witnesses: Counsel should consider whether to interview the potential witnesses, including any complaining witnesses and others adverse to the accused. If the attorney conducts such interviews of potential witnesses, he or she should attempt to do so in the presence of a third person who will be available, if necessary, to testify as a defense witness at trial. Alternatively, counsel should have an investigator conduct such interviews.

The police and prosecution

Counsel should make efforts to secure information in the possession of the prosecution or law enforcement authorities, including police reports. Where

necessary, counsel should pursue such efforts through formal and informal discovery unless a sound tactical reason exists for not doing so.

Physical evidence

Where appropriate, counsel should make a prompt request to the police or investigative agency for any physical evidence or expert reports relevant to the offense or sentencing.

The scene

Where appropriate, counsel should attempt to view the scene of the alleged offense. This should be done under circumstances as similar as possible to those existing at the time of the alleged incident (e.g., weather, time of day, and lighting conditions).

Expert assistance

Counsel should secure the assistance of experts where it is necessary or appropriate to:

the preparation of the defense; adequate understanding of the prosecution's case;

rebut the prosecution's case.

Additionally, the American Bar Association (ABA) has published similar guide- lines for representation in capital cases (ABA, 2003). Although these are meant for cases involving the death penalty, most are applicable to all forms of crimi- nal representation. These recommendations are based on both case law and the U.S. Constitution. The following excerpt from the ABA Guidelines is inclusive of those from the NLADA (ABA, 2003, p.1018):

1. Charging Documents:

Copies of all charging documents in the case should be obtained and examined in the context of the applicable law to identify:

a. The elements of the charged offense(s), including the element(s) alleged to make the death penalty applicable; b. the defenses, ordinary and affirmative, that may be available to the substantive charge and to the applicability of the death penalty; c. any issues, constitutional or otherwise, (such as statutes of limitations or double jeopardy) that can be raised to attack the charging documents; and d. defense counsel's right to obtain information in the possession of the government, and the applicability, extent, and validity of any obligation that might arise to provide reciprocal discovery.

2. Potential Witnesses:

a. Barring exceptional circumstances, counsel should seek out and interview potential witnesses, including, but not limited to:

(1) eyewitnesses or other witnesses having purported knowledge of events surrounding the alleged offense itself; (2) potential alibi witnesses; (3) witnesses familiar with aspects of the client's life history that might affect the likelihood that the client committed the charged offense(s), and the degree of culpability for the offense, including: (a) members of the client's immediate and extended family (b) neighbors, friends, and acquaintances who knew the client or his family (c) former teachers, clergy, employers, co-workers, social service providers, and doctors (d) correctional, probation, or parole officers; (4) members of the victim's family.

b. Counsel should conduct interviews of potential witnesses in the presence of a third person so that there is someone to call as a defense witness at trial.

Alternatively, counsel should have an investigator or mitigation specialist conduct the interviews. Counsel should investigate all sources of possible impeachment of defense and prosecution witnesses.

The Police and Prosecution:

Counsel should make efforts to secure information in the possession of the prosecution or law enforcement authorities, including police reports, autopsy reports, photos, video or audio tape recordings, and crime scene and crime lab reports together with the underlying data therefore. Where necessary, counsel should pursue such efforts through formal and informal discovery.

Physical Evidence:

Counsel should make a prompt request to the relevant government agencies for any physical evidence or expert reports relevant to the offense or sentencing, as well as the underlying materials. With the assistance of appropriate experts, counsel should then aggressively re-examine all of the government's forensic evidence, and conduct appropriate analyses of all other available forensic evidence.

The Scene: Counsel should view the scene of the alleged offense as soon as possible. This should be done under circumstances as similar as possible to those existing at the time of the alleged incident (e.g., weather, time of day, and lighting conditions).

These guidelines give the criminal defense investigator an overlay of the functions and responsibilities encountered in a major case. Just a cursory look reveals how complex and involved these responsibilities can be. In reality, very few individuals have the experience and skill necessary to perform a major case

investigation on their own. Often they will have another investigator assist, appointed by the court or hired by the attorney to share the workload the proper judicial system requires that a competent defense challenge the prosecution's case. This function is so crucial that it bears repeating: every fact that the state claims in its charges against the defendant must be tested. In this sense, a process akin to the scientific method needs to be employed. This method is succinctly described by Turvey (2008, p. 44) as "[a] way to investigate how or why something works or how something happened, through the development of a hypothesis and subsequent attempts at falsification through testing and other accepted means." The state, by means of indictment or complaint, has formed the hypothesis that the defendant has committed one or more crimes. It is unusual for state investigative agencies to attack their own case theories, a tendency that increases the likelihood of a biased outcome. Evidence that supports their charges is advanced, while other evidence that may not is ignored. In extreme cases it may even be altered or hidden.

This failure of investigative logic is not categorical for all prosecutorial investigations. There are many excellent and professional law enforcement officers and district attorneys who work hard to rule out all possible defects in their hypotheses and ensuing conclusions. The problem is that the defense does not know whether the case at hand was actually subjected to critical thinking or methodical examination. Many cases are sent up from a police agency for prosecution without the benefit of such rigor. It is the duty of the criminal defense investigator to be skeptical and examine all the facts and evidence available in

the state's case to be able to disprove their theories. Whether the CDI fails or succeeds, the justice system is more informed for his or her efforts.

The Mitigation Specialist Sandra Lockett was the getaway driver in a pawnshop robbery that resulted in the proprietor's death. Lockett was tried for her involvement in the crime and ultimately convicted and sentenced to death. At issue was whether the State of Ohio had unconstitutionally prohibited Lockett from introducing mitigating evidence that could have persuaded a jury to sentence her to another sentence than death. That mitigating evidence would have included the victim's actions contributing to his death that the offense was committed under duress and coercion, and the offense was the product of mental deficiencies. In 1978, the U.S. Supreme Court considered the Lockett case and ruled that there is a constitutional right for every defendant in a capital case to be considered as an individual during his or her capital proceedings (*Lockett v. Ohio*, 1978). This meant consideration of mitigating factors. These factors included any aspect of a defendant's character, upbringing, mental status, or circumstances about the crime which might provide a reason for a sentence other than death. This seminal decision has been gradually expanded over the years to include any factor which the defendant believes might help a jury decide for a non death sentence. The defendant, the Supreme Court has ruled, must be sentenced as a unique individual in relation to the crime he or she has committed. As a result of this and related decisions, death penalty trials are divided into two separate phases: the guilt phase and the penalty phase. In the guilt phase, the jury decides

whether or not the defendant committed the crime and whether the special circumstances for capital murder have been met. Each state has different criteria, such as murder during the commission of another felony, murder of a police officer, or murder involving torture, to name just a few. When a capital defendant is found to be guilty, he or she is then entitled to a separate trial to determine what the punishment should be. This is referred to as the penalty phase. The options for punishment in the penalty phase include, generally, death or life without the possibility of parole (a.k.a. L-WOP).

In the landmark case of *Penry v. Lynaugh* (1988), the court re-emphasized that to preserve fairness, trial judges must allow the defense to present mitigation evidence when the death penalty is involved. The court stated that the failure to allow or provide mitigating evidence during the penalty phase can be as devastating as the failure to present proof of innocence in the guilt phase. This decision reinforced a growing recognition in the legal community of the importance of “humanizing” the defendant.

Out of the procedural need mandated in these court decisions has risen the need for the mitigation specialist. The mitigation specialist is essentially the social and psychological biographer of the defendant.

The Honorable Helen G. Berrigan perhaps best described the role of the mitigation specialist as follows (2008, p. 827):

The mitigation specialist must have the skills and experience needed to investigate, analyze, evaluate the life history of the defendant. The specialists are generally trained in the social sciences, with college degrees in social work or psychology, similar to the probation officers and provide background data to

judges on non-capital sentencing. They are adept at gathering institutional records, interviewing lay and professional people, and compiling case histories. Significantly, they are trained in uncovering family drama and screening for often subtle mental and psychological disorders. They are likewise experienced in interpersonal communication so they know how to develop trust and rapport with even the most difficult or distrustful of individuals. A criminal investigator is unlikely to have these skills. A typical criminal investigator is likely to have a law enforcement background, but without training in the social sciences. Such investigators are invaluable in preparing for the guilt phase of a capital case—they watch, when, and how the alleged crime occurred (“just the facts, ma’am”) but are not skilled at assessing “why” it happened, which is the primary piece of the mitigation defense.

Similarly, a criminal defense lawyer is unlikely to have the necessary skills to amass the mitigation evidence. Lawyers are adept at legal analysis, fitting facts to legal principles, dissecting prior jurisprudence all essential to an effective defense but often involving abstract concepts far afield from the social sciences. Lawyers are not trained in the communication (particularly listening) skills needed, nor perhaps do they have the time or patience, to delve deeply into the life history of their client. They are not knowledgeable about uncovering family abuse or assessing for mental illness, nor recognizing other nuanced factors that could be invaluable mitigation evidence. Lawyers are advocates, not investigators and certainly not social workers. On the contrary, lawyers are often perceived by clients and family members as intimidating, and if court appointed, may not even be trusted. Within the criminal justice system,

mitigation specialists are needed for the monumental task of investigating, identifying, and developing the evidence needed for a constitutionally effective defense. In 2003, the American Bar Association published its standards for the representation of capital defendants previously cited. With respect to penalty phase, the ABA (2003) has established the following as the minimal standard for preparation and presentation:

A. ...” In deciding which witnesses and evidence to prepare concerning penalty, the areas counsel should consider include the following:

Witnesses familiar with and evidence relating to the client’s life and development, from conception to the time of sentencing, that would be explanatory of the offense(s) for which the client is being sentenced, would rebut or explain evidence presented by the prosecutor, would present positive aspects of the client’s life, or would otherwise support a sentence less than death;

Expert and lay witnesses along with supporting documentation (e.g., school records, military records) to provide medical, psychological, sociological, cultural or other insights into the client’s mental and/or emotional state and life history that may explain or lessen the client’s culpability for the underlying offense(s); to give a favorable opinion as to the client’s capacity for rehabilitation, or adaptation to prison; to explain possible treatment programs; or otherwise support a sentence less than death; and/or to rebut or explain evidence presented by the prosecutor;

Witnesses who can testify about the applicable alternative to a death sentence and/or the conditions under which the alternative sentence would be served; Witnesses who can testify about the adverse impact of the client's execution on the client's family and loved ones.

Demonstrative evidence, such as photos, videos, and physical objects (e.g., trophies, artwork, military medals), and documents that humanize the client or portray him positively, such as certificates of earned awards, favorable press accounts, and letters of praise or reference. Each state has particular statutory sentencing guidelines too numerous to discuss in this chapter. However, in the penalty phase of a capital trial, there are generally four questions that the jury must answer to pass their sentence. Those basic four questions are:

1. Was the conduct that caused the death of the decedent committed deliberately and with the reasonable expectation that the death would occur?
2. Is there a probability that the defendant would commit criminal acts of violence that would constitute a continuing threat to society?
3. Was the conduct of the defendant in killing (the decedents) unreasonable in response to the provocation, if any, by the decedent(s)?
4. Should the defendant receive the death sentence? The jury of 12 persons votes for each question separately, for a total of 48 votes. If one person votes "no" on any one question, the sentence is automatically life without parole or as defined by state statute. The fourth question is the focus of the mitigation specialist. One juror can say "no" to the fourth question for any reason, and there is no burden to prove any reason beyond a reasonable doubt. A mitigation

specialist's role is unique in the world of the criminal defense investigator. As described in the ABA's guidelines of 2003, the focus of the mitigation specialist is on the defendant and minimally on the criminal fact case. The mitigation specialist focuses on the following:

Obtaining a complete understanding of the crime with respect to the defendant's behavior, this includes: Complete crime scene reconstruction. Roles of other participants, including the victim. Physical evidence of any preplanning or attempts to conceal the crime after it occurred. Signs or symptoms of altered thinking or perceptual process of the defendant by impairment of mental disorder, brain damage, toxins (drugs and alcohol), dementia, developmental disability. Accuracy of the defendant's recollection of events as compared to the physical evidence and/or witness description. Establishing trust and rapport with family members and those who "know the family secrets," i.e., physical, emotional, sexual abuse. Obtaining multiple, in-depth interviews with family members. Identifying, locating, and interviewing all available teachers, counselors, doctors, psychologists, and other third parties who would have witnessed the defendant at various stages of development and the Mitigation Specialist comment on positive traits, situational stressors, or family dysfunction with examples of each. Locating all educational, counseling, mental health treatment, and medical records, pertaining to the defendant as a youth and adult. Locating all available prenatal medical records of mother and child and birth records including a birth certificate. Locating all available medical, mental health, and legal records of all first-order relatives (mother, father, siblings). Locating all available information leading to

identification of all family members going back three generations; create a genogram showing Documents and verification of all mental health, abuse, drug and alcohol abuse. Criminal records of these family members. Allegations of child abuse, sex abuse, emotional abuse. Location and interviews of childhood friends and neighbors. The identification of potential contemporaneous mental health issues at the time of the crime or in preparation of trial. Ongoing awareness of the defendant's functioning with respect to behavior at the time of the crime and ability to aid and assist (competency to proceed) in his or her own defense. Identifying appropriate experts for examination of the defendant and providing them with the background materials relevant to their examinations. Facilitating the examination of the defendant by various psychological and psychiatric experts to evaluate Competency and ability to formulate intent Neuropsychological deficits, how does the defendant's brain function with respect to the ability to process information, make decisions, modulate mood and affect, restrain impulsive behavior? Drug and alcohol issues with respect to functioning at the time of the crime. Assembling all the data known about the defendant into a biographical story that can be told by testimony and demonstrative evidence (document exhibits, photos, etc.). Focusing on the positive worth of the individual to balance the demonization of the defendant that will take place as "aggravating factors" by the prosecution. Being aware of any factor that might convince a juror to vote "no" to a death sentence. Having thorough and complete knowledge of all potential aggravating factors as defined by statute in the jurisdiction of trial (i.e., multiple victims, lying in wait, death in the

commission of another felony, killing of a police officer, killing of a child under 12, previous felony convictions, etc.) which could be used by the state when seeking the sentence of death. Assembling this study, arranging the witnesses to testify, and assisting counsel in presenting the mitigation study to the jury. The mitigation investigation is often inappropriately referred to as providing for the “abuse excuse.” This presents a paradox for those who wish to promote the “abuse excuse” as being without merit, as it is evidence of a disingenuous desire for retribution. If our culture doesn’t believe that abuse has a dramatic, harmful effect on children and their development to healthy adulthood, why do we so aggressively prosecute child abusers and send child molesters to prison for life? Obviously, mitigation is not about generating an “excuse” but rather providing a context with respect to how an individual might come to commit a horrific crime. It is about giving the jury a complete and honest description of a person that they are charged to either kill or let live. There is no greater responsibility for a person than to cast judgment for life or death on another human being. Each juror has the right to know everything that is relevant to his or her decision. Because that decision is personal for each juror, the Supreme Court has said that anything can be a mitigating factor. The mitigation specialist is charged with preparing a case for life instead of death. It is a responsibility not to be taken lightly or by the ill prepared. As mentioned previously in this chapter, mitigation is an area in which forensic criminologists in particular can provide useful information and insights.

Case example Following is an abbreviated example of a mitigation investigation which was presented in the Post Conviction Relief Petition trial of

a man on death row on the West Coast. Because this petition was denied at the state circuit court level, it remains in litigation and will likely proceed to the federal courts under a habeas corpus petition. This may take years to litigate. The names have been changed for the consideration of those involved. The facts are as otherwise presented and in the public record. This “story” is extracted from a report written by a mitigation specialist in this case. It is written in the first person and in the words of the mitigation specialist. The specialist was hired to determine any mitigating circumstances and to testify as an expert witness as to the failure of the original trial counsel to present mitigation evidence to the jury in the penalty phase of the trial. This testimony was presented in a trial for post conviction relief. The defendant is identified as “the Petitioner” because he is petitioning the court for a new penalty phase trial. Guilt is not an issue because he has already finished the guilt phase of the trial and was convicted. The basis for the petition involved numerous claims of what is referred to as “ineffective assistance of counsel” (a.k.a. IAC). It should be noted that the vast majority of the material presented in this description of the defendant’s life was not presented at trial, nor was trial counsel aware of it due to a lack of any mitigation investigation. This information would have been for the benefit of the jury to understand more about the defendant’s character and upbringing in a very dysfunctional family. This, of course, does not excuse the defendant’s actions but certainly clarifies what led him to such actions. In cases such as this, recall that it takes only one juror, deciding that he or she does not believe the offender should be put to death, to allow for life in prison instead of a death sentence.

The story of William Hansen verbatim: A forensic case study lessons for Uganda.

I have worked with and studied families for close to 20 years in clinical practice. I have seen the dynamics at play and how people try to survive. It is not an overnight process. The story evolves from efforts to survive and exercising of choices that cumulatively might result in disaster. This is a likely story which might have helped explain to the jury how this awful crime occurred. It would help explain why a structured, drug-free setting, away from the severe emotional stress and abuse of and by loved ones, such as the penitentiary would be a viable option to death [for this offender]. Every juror knows of someone who has endured similar events in his story and it is likely that at least one juror would identify with the Petitioner and have mercy. This story is based on the insights and observations of those persons who knew the Petitioner and his family. This was the story that was not told [during the original penalty phase] yet all the information was available in 1995 for the asking, assembling and presentation to the jury. There are more details to this story which should have been presented at trial through the testimony of numerous witnesses. It is not an excuse for what William Hansen did on May 10, 1994, but it does help explain how this horrible event may have evolved.

The onset of the circumstances that contributed to the Petitioner's eventual participation of this brutal homicide may have begun at least a generation before. Donna Hansen, mother of the Petitioner, was herself a product and victim of a home in which poverty, abandonment, physical and emotional abuse prevailed. She and her family survived that situation the best that they

could. She developed certain coping skills, some of which she learned from her own mother, to move forward in her life. Probably the most obvious of those which she recognizes herself is the ability to stifle emotions and not reveal how she is feeling. Doing so probably protected her from emotional and physical abuse as a young woman. At 17, she became involved with James Hansen and left with him at 18 in a “jailbreak marriage.” She was hopeful that such a marriage would provide her an escape from the environment in which she was living. Approximately a year after their marriage, the Petitioner, William Hansen, was born. It is not clear when James Hansen’s consumption of alcohol became problematic in their relationship. He maintained a job and along with Donna was able to provide the family with a reasonable standard of living. As time progressed the old coping skill of maintaining a poker face became once again functional for Donna Hansen in her marriage to an alcoholic, angry, and abusive man. As the children grew, they too adopted this style of coping. It is a classic alcoholic family dynamic that the children adopt one of several roles to survive the chaos and unpredictability. In order to cope and avoid the scrutiny of an intoxicated, angry and unpredictable parent, children often develop the skills to become “invisible.” They do not express their emotions for fear of retribution, nor do they interact intimately with their parents. If you don’t take risks you don’t get hurt.

By the time the Petitioner entered elementary school, he had likely already learned to be very careful in his relationships. As reported by his elementary school teachers, he was cautious in entering into group activities where he had to disclose anything about himself. He also would often become “needy” from some of his teachers, usually women and cautious in his relationships with male teachers. His early struggling in academics could have been a result of situational stress or perhaps a mild learning disability. He had a history of a head injury resulting in a loss of consciousness at a very young age reported by mother to your Affiant in an interview in 2000. It is unknown whether or not

this injury may have contributed to his learning difficulties. It may have been prophetic, that as early as the second grade his teachers and school psychologist realized that William needed structure and consistency to be successful. The possibility of a learning disability would only complicate matters if not addressed. William's mother has little recollection or familiarity with his educational history, which is suggestive of a possible emotional "disconnect" with Petitioner and his education and life.

Over time, William Hansen began demonstrating an increased desire to withdraw and disengage from other people. He began retreating into video games and other solo activities. As he became older he withdrew into music and drugs. He began to become increasingly oppositional with his parents. Petitioner's mother stated that she would make William promise not to do drugs and he would agree but that he would then ignore her. There was no follow through discipline by either parent. Along the way, he demonstrated by his art to Marjorie Perry, a dysfunctional and chaotic family. A picture drawn by the Petitioner depicted a family watching chaos on the television. Petitioner's Exhibit #100. There was no personal connection between the characters in this picture as all one could see were the back of their heads. There was a small animal crawling up a curtain which was described as a rat or a mouse to Ms. Perry by the Petitioner. Petitioner reported to Ms. Perry that his father, James Hansen, shot mice or rats off the curtains with a BB gun in the living room while they were watching TV a subtle hint of violence in what would normally be considered a peaceful family gathering. This was a family which was very skilled at concealing the events that occurred within the four walls of that home. William Hansen recalls his father drinking beer to intoxication "as far back as he could remember." His mother, Donna Hansen, reported to me that her husband would drink to intoxication and while cleaning his guns express his anger—brandishing the guns to her and himself. He was undoubtedly upset at his wife's described "cold and icy" demeanor and

withdrawal from him and the other family members. That was her defense from the abuse. Donna Hansen said that during these drunken episodes with firearms, James Hansen would threaten to kill her, kill William and Jonas, and set the house on fire and then kill himself. He would then threaten to go to the garage and kill himself at which time she would follow him out and talk him out of it. These rants by Mr. Hansen occurred in the home while it was occupied by the Petitioner and his younger brother. I spoke to the neighbor across the street, Nina Olsen, who heard loud noises, apparent yelling, emanating from the Hansen household.

At 14 or 15 years of age, the Petitioner began smoking large quantities of marijuana on a daily basis. He dropped out of school in the 10th Grade and generally rebelled against his father. His father was adamant against drugs yet did not see his own drug addiction to alcohol. See Trial Testimony 1509. The mother's emotional withdrawal from the family was the model for the Petitioner's own withdrawal from the world.

Approximately one month before the murder at the 7-11 Mini Mart, Donna Hansen decided it was time to leave the marriage and did so a month after the murder. She chose to reduce her stress levels by leaving her husband. It was a matter of survival for her. William, chose to stay with his father, he told your Affiant on one occasion: "I could control him I made sure he ate." He was acting the classic role of an enabler. The Petitioner himself had been avoiding the emotional conflict by increased amounts of marijuana smoking for several years and large amounts of LSD for several months prior to the murder. Petitioner's mother told your Affiant in an interview that she announced her intention to leave his father several weeks before the 7-11 Mini Mart murder. She testified that she moved out a short time after the murder. See Trial Testimony 1474.

The state attempts to present this horrific crime in simplistic terms. As a mitigation expert, I know

that it is imperative that in a death penalty case that the Defendant's life be presented in its entirety, with all of its complexities. Unless a thorough examination of the Defendant's life and development are conducted, and presented, the jury is denied all the information they need to render a verdict other than death.

...The Fourth Question "Should the defendant receive the death sentence?" requires that defense counsel "tell the defendant's story" to enable single or multiple jurors to find a reason not to impose a capital sentence. The process of telling that story and the research and experience needed to do so have been outlined thoroughly through the capital defense literature and numerous state and federal Appellate and Supreme Court decisions. The references provided at the beginning of this affidavit demonstrate that the process has been evolving for years prior to the 1995 trial. In this particular case, it is my opinion as a trained and experienced death penalty investigator and mitigation specialist, that although the defense investigators appointed to both the fact and mitigation investigations had the best of intentions, they were not equipped to adequately recognize salient sociological, psychological, and family systems dynamics to be able to provide trial counsel and the psychological experts retained by defense counsel the information on which to tell the complete story of William Hansen. Capital defendants rarely come from highly functional families. These families are often closed, secretive, and uncooperative and many even sabotage counsel's efforts during the penalty phase. Trial counsel has a responsibility to ensure that the defense team has an individual or individuals trained in the intervention and understanding of complex family dynamics to assist the fact investigators and experts in gathering this valuable information and managing difficult or special needs clients and their families. In the capital trial of William J. Hansen, it is my opinion that trial counsel were clearly deficient and were inadequate in this aspect of preparing for the penalty phase. The Petitioner's due process right to have his story adequately told did not occur

and the jury's right to hear his story was denied. The opportunity for a likely sympathetic juror to impose a life sentence was missed.

KNOWLEDGE AND EDUCATION

Knowledge and Education Criminal defense investigation is equal parts shoe leather, interviewing, and research. Therefore, a host of skills are needed to be successful. But it is also important to accept that no one investigator can do everything. This is why many investigators specialize while finding a broad knowledge base invaluable. Consider the following examples of the kinds of knowledge that generally prove helpful to CDIs, with the caveat that they are not necessarily trying to become experts in their own right.

Knowledge of forensic subjects and experts Good CDIs will have an extensive library consisting of reference material developed from every case they've worked. This will include manuals and articles on general criminal procedure and law, as well as textbooks and journals on everything from pharmacology to forensic science and psychology. Albert Einstein prided himself on not knowing the answer to every question but knowing where to find the answer. Any investigator with that kind of skill and humility is a huge asset. Further still, developing a large database of forensic experts from a wide variety of specialties is crucial. The reason is that most attorneys are not adept at locating experts in areas that they have not explored in previous cases. Investigators must therefore start collecting expert curriculum vitae (or resumes) and business cards very early in their career sorting the good from the bad, the competent from the inept, and the ethical from the frauds. Many attorneys specifically hire or seek to appoint investigators because of their broad fund of knowledge and reputation in this regard.

Knowledge of legal and police procedures Criminal defense investigators need a working knowledge of criminal law and police procedures. Consequently, former law enforcement investigators entering the field of private

investigation have a distinct advantage. However, this should not dissuade a new investigator who lacks such a background. The reason is that many law enforcement investigators lack this knowledge themselves, and it is not a secret knowable only to a select few. The law and related legal rulings are publicly available. And, being in or part of a bureaucracy, most law enforcement investigators and their respective agencies are slow to keep up with the changes in the legal landscape—that is, unless such changes involve an issue that has adversely affected their own criminal caseload or departmental liability.

Moreover, in most states, law enforcement agency policy and procedure manuals, as well as training materials, are available pursuant to public records disclosure request. These materials must be requested at the outset of every case and made part of the investigator's library. In many law enforcement agencies, policy and procedure manuals are read only once, if ever, by employees and then not revisited. Even if employees do read up on their own agency, that is generally the limit of their knowledge. Given these realities, it is easy to appreciate how CDIs can accumulate manuals and materials from multiple agencies and thereby develop knowledge that is equal to, if not superior to, that of their law enforcement counterparts in this regard. However, dedicated CDIs will not stop there. The author recommends that investigators should attend the continuing legal education seminars given to defense attorneys by their various professional organizations. There are also numerous resources available from professional investigator organizations. And finally, Perron (1998) and Ciolino (2005) have written excellent guides for criminal offense investigators which essentially outline various approaches to conducting criminal defense investigations. These are excellent references for new investigators and a good review for seasoned CDIs. A CDI's development of legal and law enforcement procedural knowledge should be viewed as an

ongoing process that never ends, as law, policies, and procedures are constantly evolving.

Educational Background While there are no formal educational background requirements in this profession, CDIs without an education beyond high school are operating at a distinct disadvantage. They must possess the ability to read with comprehension, to perform research on any subject drawing from a variety of databases, and to write their observations clearly. They must also be able to think critically. In terms of subject matter, CDIs must be equally conversant in the law, human behavior, and the forensic sciences. Degrees in criminology, criminal justice, history, psychology, sociology, law, and forensic science are therefore among those most recommended. Education is a process and not a result; therefore, CDIs must remain current. Typically, this may be accomplished by satisfying the continuing education requirements of investigative professional organizations of any actual merit. Therefore, it is recommended that CDIs join such organizations.

CHALLENGES FOR THE CDI

This brief discussion is presented to prepare aspiring CDIs for some of the realities of being a private or court-appointed investigator.

Challenges for the CDI

Income:

Some criminal defense investigators work for the government in salaried positions. The federal defender, the state public defender, and the public defender at a county level—each of these may employ full-time criminal investigators shared as a resource among multiple attorneys. Even some large law firms and insurance companies do the same. However, the vast majority of criminal defense investigators are self-employed, independent contractors. Consequently, they do not have a regular flow of income and must live case-to-case, billing at a preapproved hourly rate. Compensation for one's work at a rate commensurate with one's skill and knowledge require discipline and

perseverance. When hired by a client through an attorney on a “retained” case (where the accused pays for his or her own defense), CDIs usually are paid by the hour at a rate agreeable to the client and investigator or on a flat “case rate” basis. Smart CDIs will be paid upfront through a “retainer” and continue to work only when there is “money in the account.” If clients lose their case, which they often do, they tend not to pay as willingly or in some cases at all. The hourly rates charged by CDIs vary greatly by jurisdiction, with some regions paying a viable rate and other areas a pittance to the attorney and the investigator. Those areas that are economically depressed and mostly rural tend to provide less assistance. There are many considerations regarding how one establishes a fee schedule. Knowledge, skill, experience, and demand are perhaps the most key determinants to an investigator’s rate. CDIs doing strictly indigent defense cases must work many hours and keep overhead very low to make a living. Most investigators strive to keep a balance of retained and court-appointed cases. The business aspect of private investigators and criminal defense investigators in particular is, to say the least, difficult.

The “power of the Badge”

Apart from how CDIs are paid, the most significant challenge is the disparity in public recognition between law enforcement investigators and the private investigator community. Police officers or federal agents can walk into just about any business, school, hospital, or other law enforcement agency and, upon displaying their official credentials, can usually count on immediate assistance. This is commonly referred to as the “power of the badge”; a reference to circumstances in which people comply with law enforcement requests whether there is a legal requirement to do so or not. There is a tradition of cultural deference to law enforcement officials based on their statutory powers and, quite frankly, the resulting public fear. As private investigators, CDIs have no legal authority save those of every other citizen. There is no duty to arrest or to intervene in criminal behavior. Nor is there a

statutory obligation for ordinary citizens to comply or cooperate with CDIs unless there is a court order. Therefore, while private CDIs may have state license credentials, rarely will these have the same impact with respect to obtaining cooperation as the police badge. Skilled CDIs soon learn that it is necessary to develop a style and approach that helps obtain cooperation in getting the information being sought. Good people skills are a must. On the other hand, sarcasm, arrogance, and a threatening demeanor will not work the majority of the time, nor is such behavior professional. Good CDIs will have the skill to blend in to the culture in which they are operating and present themselves as genuine, respectful, trustworthy, and assertive persons. Developing a personal style that encourages witnesses and other persons to be willing to talk about subjects and topics about which they do not wish to speak is a critical skill for CDIs. It is not uncommon for the “power of the badge” and the occasional arrogance that accompany it to make this job easier for CDIs. Such interactions leave a bad taste in the mouths of many. For this reason, a badge is the last symbol that many CDIs want to display.

Criminal defense investigators are essential to the balance of any adversarial system and are specifically allowed under the U.S. Constitution. These individuals perform investigative services for agencies, attorneys, or private clients on their behalf, outside the subordination of law enforcement. The role of the CDI basically includes reinvestigating the case that will be presented by the state against a defendant. This includes all the general tasks of a police investigator, such as interviewing and reinterviewing witnesses, victims, and suspects; reviewing reports, statements, and physical evidence; as well as undergoing the never-ending quest for evidence that the state wishes to withhold. It is therefore a CDI’s job to identify and test the strength of evidence and theories that implicate the defendant, as well as any alternate theories. Specifically, CDIs should examine the charging documents, potential witnesses, the police and prosecution, the physical evidence, and the crime

scene in every case they encounter. Their role becomes even more important in death penalty cases. Similar to CDIs are mitigation specialists who gather evidence for the penalty phase of capital cases. These individuals also work for the defense, in an effort to bring to light mitigating evidence which allows the jury to assess the defendant as a unique individual. Basically, mitigation specialists are biographers of the defendant who gather information about any aspect of his or her history or character that will allow the jury to make a more informed decision in regards to whether this person deserves the death penalty. This role is not about providing excuses; rather, it centers around putting the crime in context in terms of the defendant's life, allowing the jury to understand more about how such a person could come to commit this crime. To be successful CDIs or mitigation specialists, individuals must have a well-rounded knowledge of forensic subjects, as well as the experts who practice these specialties. They must have a working knowledge of criminal law and police procedures, as well as the ability to interact with many different types of people since they do not have the luxury of simply flashing a badge to get information.

CHAPTER FIFTEEN



FORENSIC SCIENCE AND TECHNOLOGY IN UGANDA (DIGITAL AND CYBER CRIME)³⁴

The use of computers and other digital devices to collect, store, process and produce data is on the rise. This electronically stored information (ESI) is mission critical to government, businesses and individuals. Technology use has permeated everyday life. From mobile devices like phones and laptops to computers, digital television and digital utility meters in our homes, technology is no longer a luxury but a basic necessity of life.

Research indicates that over 95% of all documents are first created using computers. Thanks to Web 2.0, mobile device users capture and process a lot of data on their phones and iPads for upload on social networks which has given rise to big data. Daily electronic mail and phone usage traffic far outstrips postal mail and other hard copy documents. Computer technology now impacts

³⁴ Uganda Management Institute Computer Forensics & Cyber Crime Security, an investigators experience Paper by CPA Mustapha B Mugisa, MBA, CFE, CHFI – CEO Summit Consulting Ltd | www.summitcl.com

every facet of modern life. Telecom market reports indicate that over 19m Ugandans now own a mobile phone. That is over 53% of the total population. The crimes, torts and disputes, which carry us to the courtroom, are no exception. Mobile devices and ICTs facilitate the commission of crime on a grand scale. Whereas in a manual system one would have to carry manual paper files, in today's highly automated and digital world, all one needs is a username and password to transfer huge sums of money between accounts. Traditionally, a terrorist had to post a letter through the Postal system and risked delays in delivery or loss in transit. Today, an email can be delivered instantly to over 20 or 100 accomplices! With cybercrime like identify theft, one does not need to be physically present to commit a crime.

The extent of the problem

Arguably one of the worst types of cybercrime is child pornography. The lack of clear education about the dangers of Internet pornography continues to expose our children to the huge dark industry of on-line pornography. Criminals are able to coordinate their crimes through the Internet regardless of physical location. A company operating cybercrime ring in say Eastern Europe may befriend a Ugandan child found on-line using several social engineering and on-line search tools. Once a target is identified, trust is established, thereafter the child may be "poisoned" to the extent of posing while naked and even uploading personal videos in awkward situations.

Once submitted, such videos and photos are put up for sale in membership pornographic sites. In addition to privacy concerns, the victim may be found by friends or family on such sites which has a lifetime psychological torture and kills self- confidence. For some, it could be used to obtain a ransom, if one is known to be of a certain social standing. Many of the victims prefer to remain silent than report such cases. Even if they reported, the logistics involved in investigating such crimes are enormous. The exact location of the suspects is not clear. Different countries have different cyber laws, leave alone extradition of such criminals is near to impossible, if not impossible even with international support.

According to the 2012 Uganda Police Annual Crime and Road Safety Report, of the 60 cases reported and investigated, a total of UGX 1.5 billion (579,000 USD) was lost through attack vectors like social engineering and phishing to obtain victims' identities which were then used to hack into victim emails and social network profiles. Uganda Police report further shows that in 2014, ATM/VISA frauds caused a loss of over 1.2 billion UGX (460,000 USD) from 700 victims by use of scheming devices installed onto ATMs located in Kampala and other areas. "Cyber-crimes reported in 2013 were 45 cases compared to 62 cases in 2012. However, these resulted into a loss of about 18.1 billion UGX (7 Million USD). This implies that more grave losses were made subsequently despite the reduction in reported cases." The crimes included Electronic frauds, Phishing (password harvesting), Email hacking, pornography/defamation, offensive communication, mobile money frauds, SIM Card swapping and ATM/VISA frauds", the police report notes.

As an investigator, my experience is that most victims in Uganda prefer to suffer silently. This could be partly attributed to the fact that there have been limited successes with cases that have been reported or law enforcement does not offer case summaries and successes made on cases handled.

There is no one who is safe as long as their systems can be accessed via a network, specifically the Internet. With high automation and integration to third party systems using application programming interfaces (APIs) to facilitate ecommerce as well as mobile commerce, there are a plethora of attack vectors, as explained in brief case studies below. In the financial and telecom sectors, of the over 80 cybercrime cases which have been investigated by Summit Consulting Ltd Forensic Services in 2014 in Uganda:

- i. 90% of the attacks, where loss of integrity was reported, it involved internal staff at the centre of the crime i.e the attack could not have succeeded without internal staff involvement
- ii. 70% of the attacks caused loss of integrity (account manipulations by transferring money from one account to another) and loss of availability (the core application system went off line for 2 to 30 minutes) before, during or after the attack.
- iii. The attack on system availability is equally expensive, yet victims rarely quantify the cost.
- iv. Over 95% of attacks first originated from someone external of the organisation, by enticing an internal staff
- v. No attack on system integrity succeeded by external criminals working alone!

vi. Some internal staff exploited ignorant colleague's username and password. At disciplinary hearing, all suspects denied responsibility for their username and password.

Cybercrime Forensics and the law

Government of Uganda passed three critical laws i.e. the Uganda Cyber Laws namely³⁵

- (1) Computer Misuse Act, 2011;
- (2) Electronic Transactions Act, 2011;
- (3) Electronic Signatures Act, 2011.

The Computer Misuse Act provides for the safety of electronic transactions and information systems; to prevent unlawful access, abuse or misuse of information systems including computers and to make provision for securing the conduct of electronic transactions in a trustworthy electronic environment and to provide for other related matters.

The need for cyber laws in Uganda and elsewhere in the world is four fold:

- i. Tackle cyber crimes
 - ii. Address intellectual property rights and copyrights protection
 - iii. Enable e-commerce and facilitate trade
 - iv. Regulate the use of electronic signatures to ensure security (confidentiality, integrity and availability) of communication and non-repudiation
- However, successful prosecution of cybercrime cases remains a challenge.

³⁵ The Laws of Uganda

The new field of computer forensic entails the identification, preservation, extraction, interpretation and presentation of computer-related evidence. Without using the right tools and techniques to preserve, examine and extract data, law enforcement officers run the risk of losing something important, rendering what you find inadmissible, or even causing spoliation of evidence. Some of the major challenges in prosecuting cybercrime cases are the lack of standard operating procedures (SOPs) pertaining to cybercrime investigation process in Uganda. The fact that the law always lags behind technology advancement, means that some of the key stakeholders in the prosecution are not on the same page.

In Uganda, under the criminal justice system the burden of proof in a criminal matter lies upon the prosecution, which must prove all constituent components of the case. Unlike in civil matters, the standard of proof in a criminal case is beyond reasonable doubt. The main purpose of investigating any crime is to collect sufficient & legally admissible evidence to ensure conviction of offenders. The requirements of evidence in cybercrimes are not different, but its nature has made collection of evidence a specialized job.

Cybercrime investigation in Uganda fails due to poor first response procedures which often lead to spoliation of evidence making authentication of electronic evidence a tough call for any forensic examiner. The Encase Legal Journal, 5th Edition (can be accessed via Google) provides the best case law and cybercrime investigation guidelines for effective prosecution or defense. I invite all of you to read a copy.

Briefly, prosecution must prove the following three key ingredients in the offense of electronic

crime causing financial loss beyond reasonable doubt:

- i. There was dishonesty by the accused person
- ii. That the dishonesty was deliberate with intent to secure unlawful gain
- iii. That use of a digital device was involved in (i) and or (ii) above.

Without clear standard operating procedures, public awareness for effective first responder to preserve the crime scene for computer evidence, it is difficult, to prove the charges. And that is why most cyber related cases have by far failed at prosecution.

I will mention a few. Aliases have been used and some facts omitted to ensure confidentiality³⁶.

Case 1: The web phishing case

1.1 The facts in brief

A businessman based in Kampala approached an IT company for computer maintenance services. A service level agreement (SLA) was signed, specifying clear terms and responsibilities for each party. During the course of the work, unknown to the client, the IT Company outsourced part of the work to an external consultant who discovered the nature of transactions the client deals in

³⁶ References 1. Encase legal journal, 5th Edition 2. Summit Consulting Ltd cybercrime cases by Mustapha B Mugisa @www.summitcl.com 3. Cybercrime and digital evidence, Indian perspective

in. Specifically, he noted that the client supplied some imported products to several companies purchased from a specific company in the US. Using free Internet tools, the suspect (computer consultant) copied the website of the US supplier and made the replica look exactly like the genuine one and also advertised all the products the company sells. He then sent a link to the victim via a cloud (anonymous) email address, who unknowingly placed orders through the rogue website. In the process, payment instructions were exchanged. The first was a bidding security payment of US \$90,000. Thereafter, the victim was further asked to pay US \$250,000 as part of tax clearance, PVO and inspection, among others. The victim provided evidence as having paid this money to the account provided by the suspect. Before the goods could be shipped, the victim was further asked to make more payments, which aroused his suspicious. The genuine company never asked for this kind of payment, though at first he had thought of a change of process. The victim engaged Summit Consulting Ltd to help in the investigation. As a first step, Summit Consulting advised the client to report the matter to Police, considering the criminal nature of case.

1.2 The investigation

Since we did not know the suspect, yet, we started by getting the emails received in the victim's inbox. We were able to obtain the suspect's email header (has information about the senders IP address and the email path from origin to destination) as well as bank account information and the fake website that had been created. Using WHOIS.com and other cyber forensic investigation tools, we established the details of the webmaster, and key details

like email address, name, mobile phone number among others. SCL gave this information to Uganda Police, who then obtained a court order for a call log printout from the telecom company. Together with the email header information, the physical location of the suspect's office was established. After obtaining the search warrant, police visited the suspect's offices in Kampala. Key information like payment papers (invoices to the victim), registration details of the web site, etc are seized. The key omission made was the failure to seize the physical computers at the offices. Apparently, the search warrant had not specified seizure of the computers and digital devices. On return, with appropriate instruments for seizure, the office was found empty. All computers had been removed! However, after analysis of the call log patterns in addition to satellite geo-location technology, the suspects' home address is ascertained. The details are given to police who visit and fortunately seize three laptop computers and mobile phones. These are forensically processed to establish whether the emails sent to the victim originated from the laptop. An image of the suspect laptop is created and verified using a MD5, among others and analyzed using both Encase Forensic Software and Paraben Forensic Software at Summit Consulting Ltd computer forensic & training lab.

1.3 Key issues/ evidence

The payment documents for fake website registration and hosting are in the names of the suspect, who we established was a consultant attached to a computer maintenance company working with our client. Confirmed that the seized laptop with the suspect sent out the emails, which also provided the bank details where money was deposited. Pictures and documents posted on the fake

website, were found to contain artifacts in the metadata of the author, which were those of the suspect. Court order to verify bank documents and details on which money was deposited was issued and found to that the bank account opening forms had photos of the fraudster, with a relative as a co-shareholder in the company.

1.4 The charge

The suspect was charged with electronic fraud contrary to section 19 of the Computer Misuse Act, 2011 laws of Uganda. This carried punishment of up to 15 years. Also the victim will pursue civil proceedings to recover his money under civil law.

1.4 Issues and lessons to consider

Effective working relationship with Police and private company – each party handled their area of expertise. The suspect was an amateur. He used true identities for bank account information, on-line hosting, mobile phone and physical office. Working swiftly is recommended given the volatile nature of computer evidence. Forensic tools help recover even deleted evidence. The rules of evidence that apply to physical evidence apply to digital evidence. Cyber criminals are making a fortune in their schemes. Unfortunately, it is difficult to prosecute these people. Once one loses money, recovery is very difficult and a long process! This case has been running since late 2013, and civil procedures for damages are yet to commence! v. Not everyone can investigate cybercrime or process digital evidence.

Case study 2: Theft or loss of confidential information at a financial institution

Scenario 1: A business rival obtains confidential information (e.g. tender quotations, business plans, database of customer top customers & transactions, list of clients etc) through hacking including social engineering. He then uses the information for the benefit of his own business (e.g. quoting lower rates for the tender) and or sales it to competitors for use.

Scenario 2: A criminal obtains confidential financial institution or hospital information by hacking or social engineering and threatens to make the information public unless the victim pays him money.

Scenario 3: A disgruntled employee steals confidential company information and mass emails it to the victim's rivals and also posts it to the numerous websites and newsgroups; and promotes it via social networks using fake profiles.

1. The relevant law, for each scenario

a) Constitution

b) Penal code

c) Computer Misuse Act, 2011 2. Who is liable?

a. Scenario 1: The persons who steal the information as well as the persons who misuse the stolen information.

b. Scenario 2: The persons who steal the information as well as the persons who threaten the victim and extort money.

c. Scenario 3: The disgruntled employee as well as the persons who help him in stealing and distributing the information. 3. The motive? a. Scenario 1: Illegal

financial gain. b. Scenario 2: Illegal financial gain. c. Scenario3: Revenge. 4. Modus Operandi Scenario 1: The suspect could hire a skilled hacker to break into the victim systems. The hacker could also use social engineering techniques.

Illustration a: A very good looking woman went to meet the system administrator (sa) of a large company. She interviewed the SA for a “magazine article”.

During the interview she flirted a lot with the sysadmin and while leaving she “accidentally” left her pen drive at the sysadmin’s room. The sysadmin accessed the pen drive and saw that it contained many photographs of the lady. He did not realize that the photographs were Trojanized! Once the Trojan was in place, a lot of sensitive information was stolen very easily.

Illustration b: The system administrator (sa) of a large manufacturing company received a beautifully packed CD ROM containing “security updates” from the company that developed the operating system that ran his company’s servers. He installed the “updates” which in reality were Trojanized software. For 3 years after that a lot of confidential information was stolen from the company’s systems!

Scenario 2: Same as scenario 1.

Scenario 3: The disgruntled employee would usually have direct or indirect access to the information. He can use his personal computer or a cyber café to spread the information.

Investigation approach – scenario 1

1. Understand the issues a. What happened? When? b. Are there any suspects? If yes, who? Do they pass the predication test? c. Which evidence do we need? d. What is at risk? e. Possible places for evidence

Computers and networks have become so ubiquitous in our society, such an integral part of our daily lives, that any investigation or legal dispute will likely involve some form of digital evidence. Crimes like child exploitation, fraud, drug trafficking, terrorism, and homicide usually involve computers to some degree (see Chapter 2, “Forensic Analysis”). Electronic discovery has become so common in civil disputes that countries are updating their legal guidelines to address digital evidence (see Chapter 3, “Electronic Discovery”). Investigations of intrusions into corporate and government IT systems rely heavily on digital evidence, and are becoming more challenging as offenders become more adept at covering their tracks (see Chapter 4, “Intrusion Investigation”). Media reports at the time of this writing clearly demonstrate the wide diversity of cases that involve digital evidence:

- The University of California at Berkeley notified students and alumni that an intruder had gained unauthorized access to a database containing medical records of over 160,000 individuals.
- Members of an international child exploitation enterprise were sentenced for participating in an illegal organization that utilized Internet newsgroups to traffic in illegal images and videos depicting prepubescent children, including toddlers, engaged in various sexual and sadistic acts.

- David Goldenberg, an executive of AMX Corp, pled guilty to gaining unauthorized access to and stealing sensitive business information from the e-mail systems of a marketing firm that was working for a competitor, Crestron Electronics.
- The FBI is investigating a security breach of Virginia Prescription Monitoring Program (VPMP) computer systems. The data thief placed a ransom message on the VPMP web site, demanding payment of \$10 million for the return of 8 million patient records and 35.5 million prescriptions.
- Computers seized during military operations in Iraq contained details about enemy operations. Criminals are becoming more aware of digital forensic and investigation capabilities, and are making more sophisticated use of computers and networks to commit their crimes. Some are even developing “anti-forensic” methods and tools specifically designed to conceal their activities and destroy digital evidence, and generally undermine digital investigators. The integration of strong encryption into operating systems is also creating challenges for forensic examiners, potentially preventing us from recovering any digital evidence from a computer (Casey & Stellatos, 2008). Over the past few years, practitioners and researchers have made significant advances in digital forensics. Our understanding of technology has improved and we have gained the necessary experiences to further refine our practices. We have overcome major technical challenges, giving practitioners greater access to digital evidence. New forensic techniques and tools are being created to support forensic acquisition of volatile data, inspection of remote systems, and analysis of network traffic. Detailed technical coverage of

forensic analysis of Windows, Unix, and Macintosh systems is provided in Chapters 5, 6, and 7, respectively. These advances bring with them great promise, and place new demands on digital forensics and investigations, changing the terrain of the field and causing new practices to evolve, including forensic analysis of embedded systems (Chapter 8), enterprise networks (Chapter 9), and mobile telecommunications systems (Chapter 10). The recent advances and some of the current challenges were recognized in the 2009 National Academy of Sciences report:

Digital evidence has undergone a rapid maturation process. This discipline did not start in forensic laboratories. Instead, computers taken as evidence were studied by police officers and detectives who had some interest or expertise in computers. Over the past 10 years, this process has become more routine and subject to the rigors and expectations of other fields of forensic science. Three holdover challenges remain:

- (1) the digital evidence community does not have an agreed certification program or list of qualifications for digital forensic examiners;
- (2) some agencies still treat the examination of digital evidence as an investigative rather than a forensic activity; and
- (3) there is wide variability in and uncertainty about the education, experience, and training of those practicing this discipline.³⁷

All of these advancements and challenges bring us to the underlying motivations of this work; to improve technical knowledge, standards of practice, and research in digital forensics and investigation. Furthermore, by

³⁷ (National Academy of Sciences, 2009)

presenting state-of-the-art practices and tools alongside the real-world challenges that practitioners are facing in the field and limitations of forensic tools, the Handbook hopes to inspire future research and development in areas of greatest need. As far and quickly as this discipline has progressed, we continue to face major challenges in the future.

Forensic soundness as the field of digital forensics evolved from primarily dealing with hard drives to include any and all types of computer systems, one of the most fundamental challenges has been updating the generally accepted practices. There is an ongoing effort to balance the need to extract the most useful digital evidence as efficiently as possible, and the desire to acquire a pristine copy of all available data without altering anything in the process. In many situations involving new technology, particularly when dealing with volatile data in computer memory, mobile devices, and other embedded systems it is not feasible to extract valuable evidence without altering the original in some manner. Similarly, when dealing with digital evidence distributed across many computer systems, it may not be feasible to preserve everything.

In modern digital investigations, practitioners must deal with growing numbers of computer systems in a single investigation, particularly in criminal investigations of organized groups, electronic discovery of major corporations, and intrusion investigations of international scope. In such large-scale digital investigations, it is necessary to examine hundreds or thousands of computers as well as network-level logs for related evidence, making it infeasible to create forensic duplicates of every system. Existing best practice guidelines are

becoming untenable even in law enforcement digital forensic laboratories where growing caseloads and limited resources are combining to create a crisis. To address this issue, the latest edition of *The Good Practice Guide for Computer-Based Electronic Evidence* from the UK's Association of Chief Police Officers has been updated to include preservation of data from live systems, as discussed in Chapter 3 (ACPO, 2008). As the quantity of digital evidence grows and case backlogs mount, we are moving away from the resource intensive approach of creating a forensic duplicate and conducting an in-depth forensic examination of every item. A tiered approach to digital forensic examinations is being used to promptly identify items of greatest evidentiary value and produce actionable results, reserving in-depth forensic analysis for particular situations (Casey, 2009).

At the same time, there have been developments in preserving and utilizing more volatile data that can be useful in a digital investigation. Memory in computer systems can include passwords, encrypted volumes that are locked when the computer is turned off, and running programs that a suspect or computer intruder is using. Developments in memory forensics, mobile device forensics, and network forensics enable practitioners to acquire a forensic duplicate of full memory contents and extract meaningful information.

The DFRWS2005 Forensic Challenge (www.dfrws.org) sparked developments in analysis of physical memory on Microsoft Windows systems, leading to ongoing advances in tools for extracting useful information from Windows, Unix, and Macintosh operating systems. Techniques have even been developed to recover data from random access memory chips after a computer has been

turned off (Halderman, 2008). Forensic acquisition and analysis of physical memory from mobile devices has gained more attention recently and is covered in Chapter 8, “Embedded Systems Analysis.” As shown in Chapter 9, “Network Investigation,” memory forensics has been extended to Cisco network devices. We can expect continued advancement in both our ability to deal with large- scale digital investigations and to extract more information from individual systems. Whether we acquire a selection of logical files from a system or the full contents, we must keep in mind the overarching forensic principles. The purpose of a forensically sound authentication process is to support identifica- tion and authentication of evidence. In lay terms, this means that the evidence is what you claim and has not been altered or substituted since collection. Documentation is a crucial component of forensic soundness. Functionally, this process involves documenting unique characteristics of the evidence, like device IDs and MD5 hashes of acquired data, and showing continuous possession and control throughout its lifetime. Therefore, it is necessary not only to record details about the collection process, but also every time it is transported or transferred and who was responsible.

From a forensic standpoint, the acquisition process should change the original evidence as little as possible and any changes should be documented and assessed in the context of the final analytical results. Provided the acquisition process preserves a complete and accurate representation of the original data, and its authenticity and integrity can be validated, it is generally considered forensically sound. Imposing a paradigm of ‘preserve everything but change nothing’ is impractical and doing so can create undue doubt in the results of a

digital evidence analysis, with questions that have no relation to the merits of the conclusions. (Casey, 2007) Considerations of forensic soundness do not end with acquisition of data. When analyzing and producing findings from digital evidence, forensic practitioners need to follow a process that is reliable and repeatable. Again, documentation is a critical component, enabling others to evaluate findings. To appreciate the importance of forensic soundness, it is instructive to consider concrete problems that can arise from improper processing of digital evidence, and that can undermine a case as well as the underlying credibility of the forensic practitioner. Some worst-case scenarios resulting from sufficiently large breaks in chain of custody include misidentification of evidence, contamination of evidence, and loss of evidence or pertinent elements (e.g., metadata). In one case, evidence was collected from several identical computer systems, but the collection process was not thoroughly documented, making it very difficult to determine which evidence came from which system. Forensic acquisition failures include destruction of original evidence by overwriting media with zeros, saving no data in “acquired” files that actually contained evidence on original media, and updating metadata to the current date. The most common forensic examination failures are misinterpretations of data, either by a tool or person. Provided forensic practitioners are careful to preserve the selected digital evidence completely and accurately, document the process thoroughly, and check their work objectively for possible errors or omissions, these kinds of failures can be avoided or overcome.

FORENSIC ANALYSIS FUNDAMENTALS

Although practitioners must know how to obtain data using forensic tools, this alone is not sufficient. We must also have a solid understanding of how the underlying technology works, how the data are arranged, and how the tool interprets and displays the information. In addition, we require a comprehensive understanding of how to apply the scientific method to the output of our tools, closely analyzing available data for useful characteristics and possible flaws, comparing evidence with known samples to extract more information, and performing experiments to better understand the context of evidence. Forensic analysis forms the heart of this Handbook, providing useful tips for interpreting digital evidence, and conveying lessons learned from our collective experience. Whenever feasible, we provide examples of common misinterpretations and pitfalls to help digital investigators avoid repeating the same mistakes. This section lays the groundwork for effective forensic analysis, providing an overview of the scientific method and the most common analysis techniques.

Forensic examiners are neutral finders of fact, not advocates for one side over the other. The scientific method is one of the most powerful tools available to forensic examiners in fulfilling our responsibility to provide accurate evidence relating to an investigation in an objective manner. The scientific method begins with gathering facts, and forming a hypothesis based on the available evidence. However, we must be ever cognizant of the possibility that our observations or analyses are incorrect. Therefore, to assess the veracity of our

hypothesis, we need not only to seek supporting evidence but also to consider alternate possibilities. The process of trying to disprove our own hypothesis involves performing experiments to test our underlying assumptions and gain a better understanding of the digital traces we are analyzing. For instance, when examining metadata embedded in a specific file type, it is important to perform tests involving that file type to explore the relationships between common actions and associated application metadata. When forensic examiners are provided with an alternative explanation offered by the defendant, they have a duty to test such defense claims thoroughly. However, there is no ethical requirement that forensic examiners fully investigate any or all potential defenses; to do so is generally impractical. The remainder of this section describes common pitfalls and analysis techniques to help forensic examiners implement the scientific method and achieve correct results.

Data abstraction layers

At its basest level, digital evidence exists in a physical medium such as a magnetic disk, a copper wire, or a radio signal in the air. Forensic examiners rarely scrutinize the physical medium and instead use computers to translate the data into a form that humans can interpret. For instance, magnetic fields are translated into sectors, which are grouped into clusters in a file system, which in turn are organized logically into files and folders. Therefore, forensic examiners rarely see the actual data but only a representation, and we must keep in mind that each layer of abstraction can introduce error or information loss. Forensic examination tools add yet another layer of abstraction on top of

those inherent in the evidentiary data. As with any software, forensic examination tools have bugs. To complicate matters, developers of forensic examination tools may have an incomplete understanding of the systems being analyzed. A common problem in forensic examination tools is incomplete or incorrect interpretation of file systems. Errors in data translation aside, it is a good practice to examine digital evidence at both the physical and logical layers of abstraction because each can provide additional useful information. Take a Windows Mobile handheld device as an example of the value of examining data at both the physical and logical levels. An examination of the full contents of the device's physical memory, as detailed in Chapter 8, "Embedded Systems Analysis," can reveal deleted items that are not accessible in files on the device.

On the other hand, examining a Windows Mobile device from a logical perspective enables the examiner to determine which data were stored in text messages versus the Memo application, and under which category the items were stored. For instance, with associated metadata, including the name of the folder of each message. Take forensic examination of file systems as another example of the benefits of examining data at both the logical and physical levels. When instructed to search for child pornography on a computer, an inexperienced examiner might search at the file system (logical) level for files with a GIF or .JPG extension. In some cases, this may be sufficient to locate enough pornographic images to reach resolution. However, in most cases, this approach will fail to uncover all the available evidence. It is a simple matter to change a file extension from .JPG to .DOC or conceal images in some other manner, thus

foiling a search based exclusively on this characteristic. Also, some relevant files might be deleted but still resident in unallocated space. Therefore, it is usually desirable to search every sector of the physical disk for certain file types using file carving techniques presented in Chapter 2, “Forensic Analysis.”

As media formats evolve, their characteristics may change requiring forensic examiners to make adjustments to our processes and tools. For instance, when searching for JPG images, some file carving tools search for two header signatures: JFIF (hexadecimal `\xff\xd8\xff\xe0`) and Exif (`\xff\xd8\xff\xe1`). However, the two bytes following the `0xff d8` JPG header signature are an application marker that can vary depending on the implementation. For instance, the header signature `\xff\xd8\xff\xe3` is associated with stereoscopic JPG files and commonly is found in graphics files on Samsung cell phones. Some photos on Samsung phones have been observed with the header signature `\xff\xd8\xff\xdb`, which relates to the quantization table in JPG files (Mansell, 2009). Therefore, using a tool that relies on only the more common signatures to recover photos from a Samsung phone would miss the majority of files. To avoid this type of situation, practitioners should check the header signature of files of the same type that are active on the phone or that are created using a test device.

This is not to say that searching at the physical level is always preferable. Searching for keywords at the physical level has one major limitation—if a file is fragmented, with portions in nonadjacent segments, keyword searches may give inaccurate results. Fortunately, most forensic examination tools can search

each sector of the drive and are simultaneously aware of the logical arrangement of the data, giving the examiner the best of both worlds.

Evidence dynamics

One of the perpetual challenges that commonly introduces error into forensic analysis is evidence dynamics. Evidence dynamics is any influence that changes, relocates, obscures, or obliterates evidence, regardless of intent, between the time evidence is transferred and the time the case is adjudicated.³⁸ Forensic examiners will rarely have an opportunity to examine a digital crime scene in its original state and should therefore expect some anomalies. Common causes of evidence dynamics in digital investigations are provided next, with illustrative examples.

- System administrators: In an attempt to be helpful, system administrators may perform actions on the computer that inadvertently obliterates patterns and adds artifact-evidence to the scene.
- Forensic examiners: A practitioner handling a computer system may, by accident or necessity, change, relocate, obscure, or obliterate evidence.
- Offender covering behavior: The perpetrator of a crime deletes evidence from a hard drive.
- Victim actions: The victim of a crime deletes e-mails in distress or to avoid embarrassment.
- Secondary transfer: Someone uses the computer after the crime is committed, innocently altering or destroying evidence.

³⁸ (Chism & Turvey, 2000)



- **Witnesses:** A system administrator deletes suspicious accounts that have been added by an intruder hoping to prevent further unauthorized access.
- **Nature/weather:** Damage to storage media caused by exposure to natural elements like mud, blood, water, or fire.
- **Decomposition:** A tape containing evidence decays over time, eventually becoming unreadable.

When two apparently related pieces of information are found near one another on storage media, forensic examiners may need to perform additional forensic examination to determine whether they are, in fact, related. For instance, keyword searches that look for two words near each other will often return hits that associate two unrelated items. Even when a forensic tool displays both pieces of information as part of a single item, closer inspection may reveal that the tool is mistaken. In one case, a forensic tool displayed what appeared to be a web-based e-mail message but turned out to be an erroneous representation of two unrelated fragments of data on the hard disk.

Evidence dynamics creates investigative and legal challenges, making it more difficult to determine what occurred and making it more difficult to prove that the evidence is authentic and reliable. Additionally, any conclusions that a forensic examiner reaches without the knowledge of how the evidence may have changed will be open to criticism in court, may misdirect an investigation, and may even be completely incorrect.

Comparison and Identity of source Digital forensic examiners may be called upon to compare items to determine if they came from the same source. As part of a cyberextortion investigation, forensic examiners were asked to

determine whether the ransom e-mails were sent from the suspect's computer. In an intellectual property dispute, the court needed to know whether the allegedly infringing computer program was derived from the plaintiff's work. In one case, digital investigators were asked to determine which printer was used to print sensitive documents in an effort to determine who had leaked the information to news media. To answer these kinds of questions, we compare the items, characteristic by characteristic, until we are satisfied that they are sufficiently alike to conclude that they are related to one another, or sufficiently dissimilar to be unrelated. A piece of evidence can be related to a source in a number of ways (note that these relationships are not mutually exclusive): 1. Production: The source produced the evidence. The composition of the evidence is important here because any feature of the evidence may be related to the source. For example, the digital file that was sent by the Bind Torture Kill (BTK) serial killer to a television station contained data that had been embedded by the computer used to create the document,

STEPPING IN FORENSIC EVIDENCE

Responding to a computer intrusion, a system administrator decided to make a backup of the contents of the disk using the standard backup facility on the system. This backup facility was outdated and had a flaw that caused it to change the times of the files on the disk before copying them. Thus, the date-time stamps of all files on the disk were changed to the current time, making it nearly impossible to create an accurate timeline of the offense.

A suspect in a child exploitation investigation claimed that the digital photographs found on his system had been downloaded from the Internet, and that he had not produced them himself. A detailed comparison between the illegal images and exemplars taken using digital cameras found in the suspect's home revealed that one of the cameras was the source.

Leading investigators to a computer in the church where Dennis Rader was council president. Computers also have physical properties that can be embedded in the digital evidence they produce. The electronics in every digital camera has unique properties that specialized forensic analysts can utilize to link digital photographs to a specific device (Geradts et al., 2005; Fridrich et al., 2005). Production considerations are applicable when dealing with evidence sent through a network in addition to evidence created on a computer. For instance, e-mail headers are created as a message, which is passed through Message Transfer Agents. 2. Segment: The source is split into parts and parts of the whole are scattered. Fragments of digital evidence might be scattered on a disk or on a network. When a fragment of digital evidence is found at a crime scene, the challenge is to link it to its source.

In a homicide case that hinged on DNA evidence, the crime lab was unable to locate the original digital files containing the DNA analysis results. A comprehensive search of the crime lab revealed that the files of interest had been on a Macintosh computer that had been reformatted. Forensic examination of data in unallocated space revealed fragments of thousands of files associated with DNA analysis from many different cases. To find fragments associated with the specific files of interest, it was necessary to develop a customized

search algorithm based on the unique format of the files containing data associated with DNA analysis. After fragments of the files of interest were recovered, it was necessary to validate that they were put back together correctly. Viewing the data with DNA analysis software used in the crime lab indicated that the recovered fragments had been reconstituted correctly to form intact files. However, further review by subject matter experts revealed that some data were missing from the files. With this information forensic examiners were able to locate the missing data, which had not been documented in the file format specification, and complete the recovery of the files.

Alteration: The source is an agent or process that alters or modifies the evidence. In the physical world, when a crowbar is used to force something open, it leaves a unique impression on the altered object. A similar phenomenon occurs in the digital realm when an intruder exploits a vulnerability in an application or operating system—the exploit program leaves impressions on the altered system. The difference in the digital realm is that an exploit program can be copied and distributed to many offenders, and the toolmark that each program creates can be identical and can be erased by the cautious intruder.

Location: The source is a point in space. Determining where digital evidence came from is an obvious consideration that has already been alluded to in the context of creating spatial reconstruction. However, it is not always a trivial matter to determine where digital evidence originated. This consideration becomes more important as we move away from the examination of standalone

computers toward the examination of networks. For instance, determining the geographic location of a source of evidence transmitted over a network can be as simple as looking at the source IP address. However, if this source IP address is falsified, it becomes more difficult to find the actual source of the evidence.

Of course, differences will often exist between apparently similar items, whether it is a different date-time stamp of a file, slightly different data in a document, or a difference between cookie file entries from the same web site.

It follows then that total agreement between evidence and exemplar is not to be expected; some differences will be seen even if the objects are from the same source or the product of the same process. It is experience that guides the forensic scientist in distinguishing between a truly significant difference and a difference that is likely to have occurred as an expression of natural variation.

But forensic scientists universally hold that in a comparison process, differences between evidence and exemplar should be explicable. There should be some rational basis to explain away the differences that are observed, or else this value of the match is significantly diminished. (Thornton, 1997)

Modern mobile devices have the capability to embed Global Positioning System (GPS) location information in digital photo graphs. The following information extracted from a photograph taken using a G1 smart phone shows when and where the picture was taken.

Make: HTC Model: T-Mobile G1 DateTimeOriginal: 2009:05:30 14:42:38
DateTimeDigitized: 2009:05:30 14:42:38 GPSLatitudeRef: N GPSLatitude: 39

deg 16ç 0.000çç GPSLongitudeRef: W GPSLongitude: 76 deg 36ç 0.000çç
GPSDateStamp: 1911:12:18

As more computer systems incorporate GPS, we are finding more location-based information that could be useful in a digital investigation.

INTRODUCTION TO ELECTRONIC DISCOVERY IN FORENSIC SCIENCE

Electronic discovery or “e-discovery” is the exchange of data between parties in civil or criminal litigation. The process is largely controlled by attorneys who determine what data should be produced based on relevance or withheld based on claims of privilege. Forensic examiners, however, play crucial roles as technical advisors, hands-on collectors, and analysts. Some examiners view electronic discovery as a second-class endeavor, void of the investigative excitement of a trade secret case, an employment dispute, or a criminal “whodunit.” These examiners, however, overlook the enormous opportunities and challenges presented by electronic discovery. In sheer economic terms, e-discovery dwarfs traditional digital forensics and will account for \$10.67 billion in estimated revenues by 2010 (Socha & Gelbman, 2008a). This financial projection reflects the high stakes in e-discovery, where the outcome can put a company out of business or a person in jail. Given the stakes, there is little room for error at any stage of the e-discovery process—from initial identification and preservation of evidence sources to the final production and presentation of results. Failing to preserve or produce relevant evidence can be

deemed spoliation, leading to fines and other sanctions. In technical terms, electronic discovery also poses a variety of daunting questions:

Where are all the potentially relevant data stored? What should a company do to recover data from antiquated, legacy systems or to extract data from more modern systems like enterprise portals and cloud storage? Does old data need to be converted? If so, will the conversion process result in errors or changes to important metadata? Is deleted information relevant to the case? What types of false positives are being generated by keyword hits? Did the tools used to process relevant data cause any errors or omissions in the information produced to lawyers? What file server data can be attributed to specific custodians? How can an examiner authenticate database reports? What can an examiner do to fill in the gaps after e-mail has been erroneously deleted? Confusion over terminology between lawyers, forensic examiners, and lay people add to the complexity of e-discovery. For instance, a forensic examiner may use the term “image” to describe a forensic duplicate of a hard drive, whereas an IT manager may call routine backups an “image” of the system, and a lawyer may refer to a graphical rendering of a document (e.g., in TIFF format) as an “image.” These differing interpretations can lead to misunderstandings and major problems in the e-discovery process, adding frustration to an already pressured situation. Fortunately, the industry is slowly maturing and establishing a common lexicon. Thanks to recent definitions within the 2006 amendments to the U.S. Federal Rules of Civil Procedure (F.R.C.P.), attorneys and examiners now typically refer to e-discovery data as ESI—short for Electronically Stored Information. This term is interpreted broadly and includes

information stored on magnetic tapes, optical disks, or any other digital media, even if it is not technically stored in electronic form. In addition, George Socha and Thomas Gelbman have created a widely accepted framework for e-discovery consulting known as the Electronic Discovery Reference Model (EDRM). Shown in Figure 3.1, the EDRM breaks down the electronic discovery process into six different stages. The first EDRM stage involves information management and the process of “getting your electronic house in order to mitigate risk & expenses should electronic discovery become an issue.” (Socha & Gelbman, 2008a). The next identification stage marks the true beginning of a specific e-discovery case and describes the process of determining where ESI resides, its date range and format, and its potential relevance to a case. Preservation and collection cover the harvesting of data using forensic or nonforensic tools. The processing stage then covers the filtering of information by document type, data range, keywords, and so on, and the conversion of the resulting data into more user-friendly formats for review by attorneys. At this stage, forensic examiners may be asked to apply their analysis to documents of particular interest to counsel.

Case study: *Coleman v. Morgan Stanley*

In *Coleman v. Morgan Stanley*, after submitting a certificate to the court stating that all relevant e-mail had been produced, Morgan Stanley found relevant e-mail on 1600 additional backup tapes. The judge decided not to admit the new e-mail messages, and based on the company’s failure to comply with e-discovery requirements, the judge issued an “adverse inference” to the jury, namely that they could assume Morgan Stanley had engaged in fraud in the

underlying investment case. As a result, Morgan Stanley was ordered to pay \$1.5 billion in compensatory and punitive damages. An appeals court later overturned this award, but the e-discovery findings were left standing, and the company still suffered embarrassing press like the *The Wall Street Journal* article, “How Morgan Stanley botched a big case by fumbling e-mails” (Craig, 2005).

During production, data are turned over to an opposing party in the form of native documents, TIFF images, or specially tagged and encoded load files compatible with litigation support applications like Summation or Concordance. Finally, during the presentation stage, data are displayed for legal purposes in depositions or at trial. The data are often presented in their native or near-native format for evidentiary purposes, but specific content or properties may be highlighted for purposes of legal argument and persuasion.

The Electronic Discovery Reference Model outlines objectives of the processing stage, which include: “

- 1) Capture and preserve the body of electronic documents;
- 2) Associate document collections with particular users (custodians);
- 3) Capture and preserve the metadata associated with the electronic files within the collections;
- 4) Establish the parent-child relationship between the various source data files;
- 5) Automate the identification and elimination of redundant, duplicate data within the given dataset;

- 6) Provide a means to programmatically suppress material that is not relevant to the review based on criteria such as keywords, date ranges or other available metadata;
- 7) Unprotect and reveal information within files; and
- 8) Accomplish all of these goals in a manner that is both defensible with respect to clients' legal obligations and appropriately cost-effective and expedient in the context of the matter.”

This chapter explores the role of digital forensic examiners throughout these phases of e-discovery, particularly in large-scale cases involving disputes between organizations. It addresses the legal framework for e-discovery as well as unique forensic questions that arise around case management, identification and collection of ESI, and culling and production of data. Finally, this chapter describes common pitfalls in the complex, high-stakes field of e-discovery, with the goal of helping both new and experienced forensic examiners safely navigate this potential minefield.

Legal Context In the past few years, the complexity of ESI and electronic discovery has increased significantly. The set of governing regulations has become so intricate that even professionals confess that they do not understand all the rules. A 2008 survey of in-house counsel found that 79% of the 203 respondents in the United States and 84% of the 200 respondents in the United Kingdom were not up to date with ESI regulations (Kroll Ontrack, 2008). Although it is beyond the scope of this chapter to cover all aspects of the legal context of discovery of ESI, the points that are most relevant to digital investigators are presented in this section.

Legal Basis for electronic discovery in civil litigation throughout the Uganda, courts are governed by their respective rules of civil procedure. Each jurisdiction has its own set of rules, but the rules of different courts are very similar as a whole.¹ As part of any piece of civil litigation, the parties engage in a process called discovery. In general, discovery allows each party to request and acquire relevant, nonprivileged information in possession of the other parties to the litigation, as well as third parties (F.R.C.P. 26(b)). When that discoverable information is found in some sort of electronic or digital format (i.e., hard disk drive, compact disc, etc.), the process is called electronic discovery or e-discovery for short. The right to discover ESI is now well established. On December 1, 2006, amended F.R.C.P. went into effect and directly addressed the discovery of ESI. Although states have not directly adopted the principles of these amendments en masse, many states have changed their rules to follow the 2006 F.R.C.P. amendments.

International Considerations

This chapter focuses on the requirements of the United States, but digital examiners should be aware that even more stringent requirements may be present when evidence is in foreign countries. Most of Europe, for example, affords greater privacy protections to individuals in the workplace. Therefore, in countries such as France, it is often necessary to obtain the consent of an employee before conducting a search on his or her work computer. The very acts of imaging and reviewing a hard drive also may be subject to different country-specific regulations. Spanish rules, for instance, may require examiners to image a hard drive in the presence of a public notary, and analysis may be

limited to information derived from specific keyword searches, not general roaming through an EnCase file. Thus, a civil examination in that country may look more like a computer search, which is subject to a criminal search warrant in the United States. For more information on conducting internal investigations in European Union countries, see Howell & Wertheimer (2008).

Obligations and penalties Recent amendments to various rules of civil procedure require attorneys—and therefore digital examiners—to work much earlier, harder, and faster to identify and preserve potential evidence in a lawsuit. Unlike paper documents that can sit undisturbed in a filing cabinet for several years before being collected for litigation, many types of ESI are more fleeting. Drafts of smoking-gun memos can be intentionally or unwittingly deleted or overwritten by individual users, server-based e-mail can disappear automatically following a system purge of data in a mailbox that has grown too large, and archived e-mail can disappear from backup tapes that are being overwritten pursuant to a scheduled monthly tape rotation. Just how early attorneys and digital examiners need to act will vary from case to case, but generally they must take affirmative steps to preserve relevant information once litigation or the need for certain data is foreseeable. In some cases like employment actions, an organization may need to act months before a lawsuit is even filed. For example, in *Broccoli v. Echostar Communications*, the court determined that the defendant had a duty to act when the plaintiff communicated grievances to senior managers one year before the formal accusation. Failure to do so can result in severe fines and other penalties such as described next.

Case study: Zubulake v. UBS Warburg

The seminal case of *Zubulake v. UBS Warburg* outlined many ESI preservation duties in its decision. Laura Zubulake was hired as a senior salesperson to UBS Warburg. She eventually brought a lawsuit against the company for gender discrimination, and she requested, “all documents concerning any communication by or between UBS employees concerning Plaintiff.” UBS produced about 100 e-mails and claimed that its production was complete, but Ms. Zubulake’s counsel learned that UBS had not searched its backup tapes. What began as a fairly mundane employment action turned into a grand e-discovery battle, generating seven different opinions from the bench and resulting in one of the largest jury awards to a single employee in history. The court stated that “a party or anticipated party must retain all relevant documents (but not multiple identical copies) in existence at the time the duty to preserve attaches, and any relevant documents created thereafter,” and outlined three groups of interested parties who should maintain ESI:

- primary players: Those who are “likely to have discoverable information that the disclosing party may use to support its claims or defenses” (F.R.C.P. 26(a)(1)(A)).
- assistants to primary players: Those who prepared documents for those individuals that can be readily identified.
- Witnesses: “The duty also extends to information that is relevant to the claims or defenses of any party, or which is ‘relevant to the subject matter involved in the action’” (F.R.C.P. 26(b)(1)). The *Zubulake* court realized the particular difficulties associated with retrieving data from backup tapes and

noted that they generally do not need to be saved or searched, but the court noted:

[I]t does make sense to create one exception to this general rule. If a company can identify where particular employee documents are stored on backup tapes, then the tapes storing the documents of “key players” to the existing or threatened litigation should be preserved if the information contained on those tapes is not otherwise available. This exception applies to all backup tapes.

In addition to clarifying the preservation obligations in e-discovery, the Zubulake case revealed some of the penalties that can befall those who fail to meet these obligations.

The court sanctioned UBS Warburg for failing to preserve and produce e-mail backup tapes and important messages, or for producing some evidence late. The court required the company to pay for additional depositions that explored how data had gone missing in the first place. The jury heard testimony about the missing evidence and returned a verdict for \$29.3 million, including \$20.2 million in punitive damages. The Zubulake court held the attorneys partially responsible for the lost e-mail in the case and noted, “[I]t is not sufficient to notify all employees of a litigation hold and expect that the party will then retain and produce all relevant information. Counsel must take affirmative steps to monitor compliance so that all sources of discoverable information are identified and searched.” Increasingly, attorneys have taken this charge to heart and frequently turn to their digital examiners to help assure that their discovery obligations are being met.

Rather than grappling with these challenges every time new litigation erupts, some organizations are taking a more strategic approach to prepare for e-discovery and engage in data-mapping before a case even begins. The two most fundamental aspects of being prepared for e-discovery are knowing the location of key data sources and ensuring that they meet regulatory requirements while containing the minimum data necessary to support business needs. The data-mapping process involves identifying pieces of data that are key to specific and recurring types of litigation (e.g., personnel files that are relevant to employment disputes). In turn, organizations attempt to map important pieces of data to functional categories that are assigned clear backup and retention policies. Organizations can then clean house and expunge unnecessary data, not to eliminate incriminating digital evidence, but to add greater efficiency to business operations and to reduce the amount of time and resources needed to extract and review the data for litigation. In the best of all worlds, the data-mapping process cleanses a company of redundant data and rogue systems and trains employees to store their data in consistent forms at predictable locations. In a less perfect world, the data-mapping process still allows a company to think more carefully about its data and align an organization's long-term business interests with its recurring litigation concerns. For example, the data-mapping process may prompt an organization to create a forensic image of a departing employee's hard drive, especially when the employee is a high-ranking officer or is leaving under a cloud of suspicion.

Determining Violations of the electronic discovery paradi as pointed out by the Zubulake decision, the consequences of failing to preserve data early in a case can be severe. Under F.R.C.P. Rule 37, a court has broad latitude to sanction a party in a variety of ways. Of course, courts are most concerned about attorneys or litigation parties that intentionally misrepresent the evidence in their possession, as seen in the Qualcomm case. The following recommendations are provided for investigators and in-house counsel to avoid the same fate as Qualcomm (Roberts, 2008):

1. Use checklists and develop a standard discovery protocol;
2. Understand how and where your client maintains paper files and electronic information, as well as your client's business structures and practices;
3. Go to the location where information is actually maintained—do not rely entirely on the client to provide responsive materials to you;
4. Ensure you know what steps your client, colleagues, and staff have actually taken and confirm that their work has been done right;
5. Ask all witnesses about other potential witnesses and where and how evidence was maintained;
6. Use the right search terms to discover electronic information;
7. Bring your own IT staff to the client's location and have them work with the client's IT staff, employ e-discovery vendors, or both;
8. Consider entering into an agreement with opposing counsel to stipulate the locations to be searched, the individuals whose computers and hard copy records are at issue, and the search terms to be used;
9. Err on the side of production;

10. Document all steps taken to comply with your discovery protocol. This is a useful and thorough set of guidelines for investigators to use for preservation of data issues, and can also serve as a quick factsheet in preparing for depositions or testimony.

Case study: Qualcomm Inc. v. broadCom Corp.

In *Qualcomm Inc. v. Broadcom Corp.*, the underlying dispute centered on whether Qualcomm could claim a patent to video compression technology after it allegedly had participated in an industry standards-setting body known as the Joint Video Team (JVT). Qualcomm brought a lawsuit against Broadcom claiming patent infringement, but the jury ultimately returned a unanimous verdict in favor of Broadcom. During all phases of the case, Qualcomm claimed that it had not participated in the JVT. Qualcomm responded to numerous interrogatories and demands for e-mails regarding its involvement in the JVT. When a Qualcomm witness eventually admitted that the company had participated in the JVT, over 200,000 e-mails and other ESI were produced linking Qualcomm to the JVT! The court determined that Qualcomm had intentionally and maliciously hidden this information from Broadcom and the court. As a result, Qualcomm had to pay sanctions (including attorney fees) of over \$8 million and several attorneys for Qualcomm were referred to the State Bar for possible disciplinary action.

Initial Meeting, disclosures, and discovery agreements in an effort to make e-discovery more efficient, F.R.C.P. Rule 26(f) mandates that parties meet and discuss how they want to handle ESI early in a case.

The initial meetings between the parties generally address what ESI should be exchanged, in what format (e.g., native format versus tiffed images; electronic version versus a printout, on CD/DVD versus hard drive delivery media), what will constitute privileged information, and preservation considerations. Lawyers must make ESI disclosures to each other and certify that they are correct. This process is especially constructive when knowledgeable and friendly digital investigators can help lawyers understand their needs, capabilities, and costs associated with various ESI choices. The initial meeting may result in an agreement that helps all the parties understand their obligations. This same agreement can help guide the parties if a dispute should arise.

Lawyers often depend on digital examiners to help them pre-prepare for and navigate a Rule 26(f) conference. The meeting usually requires both technical and strategic thinking because full discovery can run counter to cost concerns, confidentiality or privacy issues, and claims of privilege. For example, an organization that wants to avoid costly and unnecessary restoration of backup tapes should come to the table with an idea of what those tapes contain and how much it would cost to restore them. At the same time, if a party might be embarrassed by personal information within deleted files or a computer's old Internet history, counsel for that party might be wise to suggest limiting discovery to specific types of active, user documents. Finally, privilege concerns can often be mitigated if the parties can agree on the list of attorneys that might show up in privileged documents, if they can schedule sufficient time to perform a privilege review, and if they allow each other to "claw back" privileged documents that are mistakenly produced to the other side.

Case study: Integrated Service Solutions, Inc. v. Rodman

Consider the case of Integrated Service Solutions, Inc. v. Rodman. Integrated Service Solutions (ISS) brought a claim against Rodman, which in turn required information from a nonparty, VWR. VWR was subpoenaed to produce ESI in connection with either ISS or Rodman. VWR expressed its willingness to provide data but voiced several objections, namely that the subpoena was too broad, compliance costs were too great, and that ISS might obtain unfettered access to its systems (all common concerns). VWR and ISS were able to reach a compromise in which ISS identified particular keywords, PricewaterhouseCoopers (PwC) conducted a search for \$10,000, and VWR reviewed the resulting materials presented by PwC. However, the relationship between VWR and ISS deteriorated, and when VWR stated that it did not possess information pertinent to the litigation, ISS responded that it was entitled to a copy of each file identified by the search as well as a report analyzing the information. The case went before the court, which looked at the agreement between the parties and held that ISS should receive a report from PwC describing its methods, the extent of VWR's cooperation, and some general conclusions. The court also held that VWR should pay for any costs associated with generating the report.

This case underscores several key principals of e-discovery. First, even amicable relationships between parties involved in e-discovery can deteriorate and require judicial intervention. Second, digital investigators should be sensitive to the cost and disclosure concerns of their clients. Third, digital

examiners may be called upon to play a neutral or objective role in the dispute, and last, the agreement or contract between the parties is crucial in establishing the rights of each party.

Assessing what data is reasonably accessible.

Electronic discovery involves more than the identification and collection of data because attorneys must also decide whether the data meets three criteria for production, namely whether the information is (1) relevant, (2) nonprivileged, and (3) reasonably accessible (F.R.C.P. 26(b)(2)(B)). The first two criteria make sense intuitively. Nonrelevant information is not allowed at trial because it simply bogs down the proceedings, and withholding privileged information makes sense in order to protect communications within special relationships in our society, for example, between attorneys and clients, doctors and patients, and such. Whether information is “reasonably accessible” is harder to determine, yet this is an important threshold question in any case. In the Zubulake case described earlier, the employee asked for “all documents concerning any communications by or between UBS employees concerning Plaintiff,” which included “without limitation, electronic or computerized data compilations,” to which UBS argued the request was overly broad. In that case Judge Shira A. Scheindlin, United States District Court, Southern District of New York, identified three categories of reasonably accessible data:

- (1) active, online data such as hard drive information,
- (2) near-line data to include robotic tape libraries, and
- (3) offline storage such CDs or DVDs. The judge also identified two categories of data generally not considered to be reasonably accessible: (1) backup tapes

and (2) erased, fragmented, and damaged data. Although there remains some debate about the reasonable accessibility of backup tapes used for archival purposes versus disaster recovery, many of Judge Scheindlin's distinctions were repeated in a 2005 Congressional report from the Honorable Lee H. Rosenthal, Chair of the Advisory Committee on the Federal Rules of Civil Procedure (Rosenthal, 2005), and Zubulake's categories of information still remain important guideposts (Mazza, 2007). The courts use two general factors—burden and cost—to determine the accessibility of different types of data. Using these general factors allows the courts to take into account challenges of new technologies and any disparity in resources among parties (Moore, 2005). If ESI is not readily accessible due to burden or cost, then the party possessing that ESI may not have to produce it (see F.R.C.P. 26(b)). Some parties, however, make the mistake of assessing the burden and cost on their own and unilaterally decide not to preserve or disclose data that is hard to reach or costly to produce. In fact, the rules require that a party provide “a description by category and locations, of all documents” with potentially relevant data, both reasonably and not reasonably accessible (F.R.C.P. 26(a)(1)(B)). This allows the opposing side a chance to make a good cause showing to the court why that information should be produced (F.R.C.P. 26(a)(2)(B)). These rules mean that digital examiners may have to work with IT departments to change their data retention procedures and schedules, even if only temporarily, until the parties can negotiate an ESI agreement or a court can decide what must be produced. The rules also mean that digital examiners may eventually leave behind data that they would ordinarily collect in many forensic

examinations, like e-mail backups, deleted files, and fragments of data in unallocated space. These types of data may be relatively easy to acquire in a small forensic examination but may be too difficult and too costly to gather for all custodians over time in a large e-discovery case.

Utilizing Criminal procedure to accentuate e-discovery in some cases, such as lawsuits involving fraud allegations or theft of trade secrets, digital examiners may find that the normal e-discovery process has been altered by the existence of a parallel criminal investigation. In those cases, digital examiners may be required to work with the office of a local US Attorney, State Attorney General, or District Attorney, since only these types of public officials, and not private citizens, can bring criminal suits. There are several advantages to working with a criminal agency. The first is that the agency might be able to obtain the evidence quicker than a private citizen could. For example, in *United States v. Fierros-Alvarez*, the police officer was permitted to search the contents of a cellular phone during a traffic stop. Second, the agency has greater authority to obtain information from third parties. Third, there are favorable cost considerations since a public agency will not charge you for their services. Finally, in several instances, information discovered in a criminal proceeding can be used in a subsequent civil suit. Apart from basic surveillance and interviews, criminal agencies often use four legal tools to obtain evidence in digital investigations—a hold letter, a sub-poena, a ‘d’ order, and a search warrant.² A criminal agency can preserve data early in an investigation by issuing a letter under 18 U.S.C. 2703(f) to a person or an entity like an Internet Service Provider (ISP). Based on the statute granting this

authority, the notices are often called “f letters” for short. The letter does not actually force someone to produce evidence but does require they preserve the information for 90 days (with the chance of an additional 90-day extension). This puts the party with potential evidence on notice and buys the agency some time to access that information or negotiate with the party to surrender it. Many criminal agencies also use administrative or grand jury subpoenas to obtain digital information as detailed in Federal Rules of Criminal Procedure Rule 17. The subpoenas may be limited by privacy rights set forth in the Electronic Communication Privacy Act (18 U.S.C. § 2510). Nevertheless, criminal agencies can often receive data such as a customer’s online account information and method of payment, a customer’s record of assigned IP numbers and account logins or session times, and in some instances the contents of historic e-mails. Another less popular method of obtaining evidence is through a court “d” order, under 18 U.S.C. §2703(d). This rule is not used as often because an official must be able to state with “specific and articulateable” facts that there is a reasonable belief that the targeted information is pertinent to the case. However, this method is still helpful to obtain more than just subscriber information—data such as Internet transactional information or a copy of a suspect’s private homepage. Search warrants are among the most powerful tools available to law enforcement agencies (see Federal Rules of Criminal Procedure Rule 41). Agents must receive court approval for search warrants and must show there is probable cause to believe that evidence of a specified crime can be found on a person or at a specific place and time. Search warrants are typically used to seize digital media such as computer hard drives, thumb

drives, DVDs, and such, as well as the stored content of private communications from e-mail messages, voicemail messages, or chat logs. Despite the advantages of working a case with criminal authorities, there are some potent disadvantages that need to be weighed. First, the cooperating private party loses substantial control over its case. This means that the investigation, legal decisions (i.e., venue, charges, remedies sought, etc.), and the trial itself will all be controlled by the government. Second, and on a corollary note, the private party surrenders all control over the evidence. When government agents conduct their criminal investigation, they receive the information and interpret the findings, not the private party. If private parties wish to proceed with a civil suit using the same evidence, they will typically have to wait until the criminal case has been resolved. It is imperative for digital examiners to understand the legal concepts behind electronic discovery, as described earlier. You likely will never know more than a lawyer who is familiar with all the relevant statutes and important e-discovery court decisions; however, your understanding of the basics will help you apply your art and skills and determine where you can add the most value.

Case Management of forensic cases

The total volume of potentially relevant data often presents the greatest challenge to examiners in an e-discovery case. A pure forensic matter may focus on a few documents on a single 80 GB hard drive, but an e-discovery case often encompasses a terabyte or more of data across dozens of media sources. For this reason, e-discovery requires examiners to become effective case managers and places a premium on their efficiency and organizational

skills. These traits are doubly important considering the tight deadlines that courts can impose in e-discovery cases and the high costs that clients can incur if delays or mis-takes occur.

Effective case management requires that examiners plan ahead. This means that examiners must quickly determine where potentially relevant data reside, both at the workstation and enterprise levels. As explained in more detail later in this chapter (see the section, “Identification of Electronic Data”), a sit-down meeting with a client’s IT staff, in-house counsel, and outside counsel can help focus attention on the most important data sources and determine whether crucial information might be systematically discarded or overwritten by normal business processes. Joining the attorneys in the interviews of individual custodians can also help determine if data are on expected media like local hard drives and file servers or on farflung media like individual thumb drives and home computers. This information gathering process is more straightforward and efficient when an organization has previously gone through a formal, proactive data mapping process, and knows where specific data types reside in their network. Whether examiners are dealing with a well organized or disorganized client, they should consider drafting a protocol that describes how they intend to handle different types of data associated with their case. The protocol can address issues such as what media should be searched for specific file types (e.g., the Exchange server for current e-mail, or hard drives and home directories).

Effective case management requires that examiners establish a strategic plan at the outset of an e-discovery project, and implement effective and documented

quality assurance measures throughout each step of the process. Problems can arise from both technical and human errors, and the quality assurance measures should be sufficiently comprehensive to identify both. Testing and verification of tools' strengths and weaknesses before using them in case work is critical, however it should not lull examiners into performing limited quality assurance of the results each time the tool is used (Lesemann & Reust, 2006). Archived PST, OST, MSG, and EML files), what tools can be used during collection, whether deleted data should be recovered by default, what keywords and date ranges should be used to filter the data, and what type of deduplication should be applied (e.g., eliminating duplicates within a specific custodian's data set, or eliminating duplicates across all custodians' data). Designing a protocol at the start of the e-discovery process increases an examiner's efficiency and also helps manage the expectations of the parties involved. A protocol can also help attorneys and clients come to terms with the overall volume and potential costs of e-discovery. Often it will be the digital examiner's job to run the numbers and show how the addition of even a few more data custodians can quickly increase costs. Though attorneys may think of a new custodian as a single low-cost addition to a case, that custodian probably has numerous sources of data and redundant copies of documents across multiple platforms. The following scenario shows how this multiplicative effect can quickly inflate e-discovery costs.

Digital examiners may also be asked how costly and burdensome specific types of information will be to preserve, collect, and process. This assessment may be used to decide whether certain data are "reasonably accessible," and may help

determine if and how preservation, collection, processing, review, and production costs should be shared between the parties. Under *Zubulake*, a court will consider seven factors to determine if cost-shifting is appropriate (*Zubulake v. UBS Warburg*): 1. The extent to which the request is specifically tailored to discover relevant information. 2. The availability of such information from other sources. 3. The total cost of production, compared to the amount in controversy. 4. The total cost of production, compared to the resources available to each party. 5. The relative ability of each party to control costs and its incentive to do so. 6. The importance of the issues at stake in the litigation. 7. The relative benefits to the parties of obtaining the information.

One Custodian's Data:

Individual hard drive = 6GB of user data Server e-mail = 0.50GB Server home directory data = 1GB Removable media (thumb drives) = 0.50GB Blackberries, PDAs = 0GB (if synchronized with e-mail)

Scanned paper documents = 1GB Backup tapes – e-mail for 12 mo \times 0.50GB = 6GB Backup tapes – e-docs for 12 mo \times 1.0GB = 12GB

Potential data for one additional custodian = 28GB Est. processing cost (at \$1,500/GB) = \$42,000

In an attempt to cut or limit e-discovery costs, a client will often volunteer to have individual employees or the company's own IT staff preserve and collect documents needed for litigation. This can be acceptable in many e-discovery cases. As described in more detail later, however, examiners should warn their clients and counsel of the need for more robust and verifiable preservation if the case hinges on embedded or file system metadata, important dates,

sequencing of events, alleged deletions, contested user actions, or other forensic issues. If an examiner is tasked with preserving and collecting the data in question, the examiner should verify that his or her proposed tools are adequate for the job. A dry run-on test data is often advisable because there will always be bugs in some software programs, and these bugs will vary in complexity and importance. Thus, it is important to verify, test, and document the strengths and weaknesses of a tool before using it, and apply approved patches or alternative approaches before collection begins. Effective case management also requires that examiners document their actions, not only at the beginning, but also throughout the e-discovery process. Attorneys and the courts appreciate the attention to detail applied by most forensic examiners, and if an examiner maintains an audit trail of his or her activities, it often mitigates the impact of a problem, if one does arise.

Documenting one's actions also helps outside counsel and the client track the progress of e-discovery. In this vein, forensic examiners may be accustomed to tracking their evidence by media source (e.g., laptop hard drive, desktop hard drive, DVD), but in an e-discovery case, they will probably be asked to track data by custodian, as shown in Table 3.1. This allows attorneys to sequence and prepare for litigation events such as a document production or the deposition of key witnesses. A custodian tracking sheet also allows paralegals to determine where an evidentiary gap may exist and helps them predict how much data will arrive for review and when.

FROM THE CASE FILES: DOCUMENTATION TO THE RESCUE

In the antitrust case, numerous employees with data relevant to the suit had left the client company by the time a lawsuit was filed. E-mail for former employees was located on Exchange backups, but no home directories or hard drives were located for these individuals. Later in the litigation, when the opposing party protested the lack of data available on former employees, the client's IT department disclosed that data for old employees could be found under shared folders for different departments. The client expressed outrage that this information had not been produced, but digital examiners who had kept thorough records of their collections and deliveries were able to show that data for 32 of 34 former employees had indeed been produced, just under the headings of the shared drives not under individual custodian names. Thus, despite miscommunications about the location of data for former employees, careful record keeping showed that there was little missing data, and former employee files had been produced properly in the form they were ordinarily maintained, under Federal Rules of Civil Procedure Rule 34.

Sample Tracking Sheet Summarizing ESI Preserved for Each Custodian

LAPTOP DESKTOP EXCHANGE HOME DIR

NAME Image Date E-mail (GB) E-Docs (GB) Image Date E-mail (GB) E-Docs (GB) E-mail (GB) E-Docs (GB)

John Doe 10/10/2008 1.5 1.2 10/10/2008 0 2.1 1.8 5.5

Jane Smith 10/10/2008 4.4 0.8 10/11/2008 1.2 1.7 4.3 7.7

Electronic discovery

Case management is most effective when it almost goes unnoticed, allowing attorneys and the client to focus their attention on the substance and merits of their case, not the harrowing logistical and technical hurdles posed by the e-discovery process in the background. As described earlier, this means that examiners should have a thorough understanding of the matter before identification and preservation has begun, as well as a documented quality assurance program for collecting, processing, and producing data once e-discovery has commenced.

Identification of Electronic Data

Before the ESI can be collected and preserved, the sources of potentially relevant and discoverable ESI must be identified. Although the scope of the preservation duty is typically determined by counsel, the digital investigator should develop a sufficient understanding of the organization's computer network and how the specific custodians store their data to determine what data exists and in what locations. Oftentimes this requires a more diligent and iterative investigation than counsel expects, however it is a vital step in this initial phase of e-discovery. A comprehensive and thorough investigation to identify the potentially relevant ESI is an essential component of a successful strategic plan for e-discovery projects. This investigation determines whether the data available for review is complete, and if questions and issues not apparent at the outset of the matter can be examined later down the road (Howell, 2005). A stockpile of media containing relevant data being belatedly uncovered could

call into question any prior findings or conclusions reached, and possibly could lead to penalties and sanctions from the court. There are five digital storage locations that are the typical focus of e-discovery projects (Friedberg & McGowan, 2006):

- Workstation environment, including old, current, and home desktops and laptops
- Personal Digital Assistants (PDAs), such as the BlackBerry® and Treo®
- Removable media, such as CDs, DVDs, removable USB hard drives, and USB “thumb” drives
- Server environment, including file, e-mail, instant messaging, database, application and VOIP servers
- Backup environment, including archival and disaster recovery backups

Although these storage locations are the typical focus of e-discovery projects, especially those where the data are being collected in a corporate environment, examiners should be aware of other types of storage locations that may be relevant such as digital media players and data stored by third parties (for example,

Identification of Electronic Data

Google Docs, Xdrive, Microsoft SkyDrive, blogs, and social networking sites such as MySpace and Facebook). Informational interviews and documentation requests are the core components of a comprehensive and thorough investigation to identify the potentially relevant ESI in these five locations, followed by review and analysis of the information obtained to identify inconsistencies and gaps in the data collected. In some instances, a physical search of the company premises and offsite storage is also necessary.

Informational Interviews

The first step in determining what data exist and in what location is to conduct informational interviews of both the company IT personnel and the custodians. It is helpful to have some understanding of the case particulars, including relevant data types, time period, and scope of preservation duty before conducting the interviews. In addition, although policy and procedure documentation can be requested in the IT personnel interviews, it may be helpful to request them beforehand so they can be reviewed and any questions incorporated into the interview. Documenting the information obtained in these interviews is critical for many reasons, not least of which is the possibility that the investigator may later be required to testify in a Rule 30(b)(6) deposition. For assistance in structuring and documenting the interviews, readers might develop their own interview guide. Alternatively, readers might consult various published sources for assistance. For example, Kidwell et al. (2005) provide detailed guides both for developing Rule 26 document requests and for conducting Rule 30(b)(6) depositions of IT professionals. Another source for consideration is a more recent publication of the Sedona Conference (Sedona Conference, 2008).

IT PERSONNEL INTERVIEWS

The goal of the IT personnel interviews is to gain a familiarity and understanding with the company network infrastructure to determine how and where relevant ESI is stored. When conducting informational interviews of company IT personnel, IT management such as the CIO or Director of IT will typically be

unfamiliar with the necessary infrastructure details, but should be able to identify and assemble the staff that have responsibility for the relevant environments. Oftentimes it is the staff “on the ground” who are able to provide the most accurate information regarding both the theoretical policies and the practical reality. Another point to keep in mind is that in larger companies where custodians span the nation if not the world, there may be critical differences in the computer and network infrastructure between regions and companies, and this process is complicated further if a company has undergone recent mergers and acquisitions. Suggested questions to ask IT personnel are:

- Is there a centralized asset inventory system, and if so, obtain an asset inventory for the relevant custodians. If not, what information is available to determine the history of assets used by the relevant custodians?
- Regarding workstations, what is the operating system environment? Are both desktops and laptops issued? Is disk or file level encryption used? Are the workstations owned or leased? What is the refresh cycle and what steps are taken prior to the workstations being redeployed? Are users permitted to download software onto their workstations? Are software audits performed on the workstations to determine compliance?
- Regarding PDAs and cell phones, how are the devices configured and synchronized? Is it possible that data, such as messages sent from a PDA, exist only on the PDA and not on the e-mail server? Is the BlackBerry® server located and managed in-house?
- What are the policies regarding provision and use of removable media?

- Regarding general network questions, are users able to access their workstations/e-mail/file shares remotely and if so what logs are enabled? What are the Internet browsing and computer usage policies? What network shares are typically mapped to workstations? Are any enterprise storage and retention applications implemented such as Symantec Enterprise Vault®? Is an updated general network topology or data map available? Are outdated topologies or maps available for the duration of the relevant time period?
- Regarding e-mail servers, what are their numbers, types, versions, length of time deployed and locations? What mailbox size or date restrictions are in place? Is there an automatic deletion policy in place? What logging is enabled? Are employees able to replicate or archive e-mail locally to their workstations or to mapped network shares?
- Regarding file servers, what are the numbers, types, versions, locations, length of time deployed, data type stored, and departments served. Do users have home directories? Are they restricted by size? What servers provide for collaborative access, such as group shares or SharePoint®? To which shares and/or projects do the custodians have access?
- Regarding the backup environment, what are the backup systems used for the different server environments? What are the backup schedules and retention policies? What is the date of the oldest backup? Have there been any “irregular” backups created for migration purposes or “test” servers deployed? What steps are in place to verify the success of the backup jobs?

- Please provide information on any other data repositories such as database servers, application servers, digital voicemail storage, legacy systems, document management systems, and SANs.
- Have there been any other prior or on-going investigations or litigation where data was preserved or original media collected by internal staff or outside vendors? If so, where does this data reside now? Obtaining explicit answers to these questions can be challenging and complicated due to staff turnover, changes in company structure, and lack of documentation. On the flip side when answers are provided (especially if just provided orally), care must be taken to corroborate the accuracy of the answers with technical data or other reliable information

Custodian Interviews

The goal of the custodian interviews is to determine how and where the custodians store their data. Interviews of executive assistants may be necessary if they have access to the executive's electronic data. Suggested questions to ask are:

- How many laptops and desktops do they currently use? For how long have they used them? Do they remember what happened to the computers they used before, if any? Do they use a home computer for company-related activities? Have they ever purchased a computer from the company?
- To what network shares do they have access? What network shares are typically mapped to a drive letter on their workstation(s)?
- Do they have any removable media containing company-related data?

- Do they have a PDA and/or cell phone provided by the company?
- Do they use encryption?
- Do they use any instant messaging programs? Have they installed any unapproved software programs on their workstation(s)?
- Do they archive their mail locally or maintain a copy on a company server or removable media?
- Do they access their e-mail and/or files remotely? Do they maintain an online storage account containing company data? Do they use a personal e-mail address for company related activities, including transfer of company files? The information and documentation obtained through requests and the informational interviews can assist in creating a graphical representation of the company network for the relevant time period. Although likely to be modified as new information is learned, it will serve as an important reference throughout the e-discovery project. As mentioned earlier, some larger corporations may have proactively generated a data map that will serve as the starting point for the identification of ESI.

ANALYSIS AND NEXT STEPS

Review and analysis of the information obtained is essential in identifying inconsistencies and gaps in the data identification and collection. In addition, comparison of answers in informational interviews with each other and against the documentation provided can identify consistent, corroborative information between sources, which is just as important to document as inconsistencies. This review and analysis is not typically short and sweet, and is often an iterative process that must be undertaken as many times as new information is

obtained, including after initial review of the data collected and from forensic analysis of the preserved data.

There are many challenges involved in identifying and collecting ESI, including the sheer number and variety of digital storage devices that exist in many companies, lack of documentation and knowledge of assets and IT infrastructure, and deliberate obfuscation by company employees. Only through a comprehensive, diligent investigation and analysis you are likely to identify all relevant ESI in preparation for collection and preservation.

E-discovery consultants had been brought in by outside counsel to a national publicly-held company facing a regulatory investigation into its financial dealings, and were initially tasked with identifying the data sources for custodians in executive management. Counsel had determined that any company-issued computer used by the custodians in the relevant date range needed to be collected, thereby necessitating investigation into old and home computers. Without an updated, centralized asset tracking system, company IT staff had cobbled together an asset inventory from their own memory and from lists created by previous employees and interns. The inventory showed that two Macintosh laptops had been issued to the Chief Operations Officer (COO), however only one had been provided for preservation by the COO, and he maintained that he had not been issued any other Macintosh laptop. The e-discovery consultants searched through the COO's and his assistant's e-mail that had already been collected, identifying e-mail between the COO and the IT department regarding two different Macintosh laptops, and then found corresponding tickets in the company helpdesk system showing requests for

technical assistance from the COO. When confronted with this evidence, the COO “found” the laptop in a box in his attic and provided it to the digital investigator. Subsequent analysis of the laptop showed extensive deletion activity the day before the COO had handed over the laptop.

In a standard informational interview, investigators were told by the IT department in the Eastern European division of an international company that IT followed a strict process of wiping the “old” computer whenever a new computer was provided to an employee. The investigators attempted to independently verify this claim through careful comparison of serial numbers and identification of “old” computers that had been transferred to new users. This review and analysis showed intact user accounts for Custodian A on the computers being used by Custodian B. The investigators ultimately uncovered rampant “trading” and “sharing” of assets, together with “gifting” of assets by high level executives to subordinate employees, thereby prompting a much larger investigation and preservation effort.

FORENSIC PRESERVATION OF DATA

Having conducted various informational interviews and having received and reviewed documents, lists and inventories from various sources to create an initial company data map, the next step for counsel is to select which of the available sources of ESI should be preserved and collected. The specific facts of the matter will guide counsel’s decision regarding preservation. Federal Rules of Evidence Rule 26(b)(1) allows that parties “may obtain discovery regarding any non-privileged matter that is relevant to any party’s claim or

defense – including the existence, description, nature, custody, condition, and location of any documents or other tangible things and the identity and location of persons who know of any discoverable matter.” Once counsel selects which sources of ESI are likely to contain relevant data and should be preserved in the matter, the next two phases of the electronic discovery process as depicted in Figure 3.1 include preservation and collection. Preservation includes steps taken to “ensure that ESI is protected against inappropriate alteration or destruction” and collection is the process of “gathering ESI for future use in the electronic discovery process...”

Preservation for electronic discovery has become a complicated, multi-faceted, steadily-changing concept in recent years. Starting with the nebulous determination of when the duty to preserve arises, then continuing into the litigation hold process (often equated to the herding of cats) and the staggering volumes of material which may need to be preserved in multiple global locations, platforms and formats, the task of preservation is an enormous challenge for the modern litigator. Seeking a foundation in reasonableness, wrestling with the scope of preservation is often an exercise in finding an acceptable balance between offsetting the risks of spoliation and sanctions related to destruction of evidence, against allowing the business client to continue to operate its business in a somewhat normal fashion. (Socha & Gelbman, 2008b) Although the EDRM defines “preservation” and “collection” as different stages in electronic discovery for civil litigation, it has been our experience that preservation and collection must be done at the same time when conducting investigations, whether the underlying investigation is related to a

financial statement restatement, allegations of stock option backdating, alleged violations of the Foreign Corrupt Practices Act, or other fraud, bribery, or corruption investigation. Given the volatile nature of electronic evidence and the ability of a bad actor to quickly destroy that evidence, a digital investigator's perspective must be different.

Electronic evidence that is not yet in the hands of someone who recognizes its volatility (i.e., the evidence has not been collected) and who is also absolutely committed to its protection has not really been preserved, regardless of the content of any preservation notice corporate counsel may have sent to custodians.

PRACTITIONER'S TIP: DESTRUCTION OF EVIDENCE

Besides the case cited, we have conducted numerous investigations where custodians, prior to turning over data sources under their control, have actively taken steps to destroy relevant evidence in contravention of counsels' notice to them to "preserve" data. These steps have included actions like:

- Using a data destruction tool on their desktop hard drive to destroy selected files
- Completely wiping their entire hard drive
- Reinstalling the operating system onto their laptop hard drive
- Removing the original hard drive from their laptop and replacing it with a new, blank drive
- Copying relevant files from their laptop to a network drive or USB drive and deleting the relevant files from their laptop



- Printing relevant files, deleting them from the computer, and attempting to wipe the hard drive using a data destruction tool
- Setting the system clock on their computer to an earlier date and attempting to fabricate electronic evidence dated and timed to corroborate a story
- Sending themselves e-mail to attempt to fabricate electronic evidence
- Physically destroying their laptop hard drive with a hammer and reporting that the drive “crashed”
- Taking boxes of relevant paper files from their office to the restroom and flushing documents down the toilet
- Hiding relevant backup tapes in their vehicle
- Surreptitiously removing labels from relevant backup tapes, inserting them into a tape robot, and scheduling an immediate out-of-cycle backup to overwrite the relevant tapes
- Purchasing their corporate owned computer from the company the day before a scheduled forensic collection and declaring it “personal” property not subject to production.

From The Case Files: Preserved Backup Tapes Put Back into Rotation

We were retained by outside counsel as part of the investigation team examining the facts and circumstances surrounding a financial statement restatement by an overseas bank with US offices. The principal accounting issue focused on the financial statement treatment of certain loans the bank made and then sold. It was alleged that certain bank executives routinely made

undisclosed side agreements with the purchasers to buy back loans that eventually defaulted after the sale. Commitments to buy back defaulted loans would have an affect on the accounting treatment of the transactions. Faced with pending regulatory inquiries, in-house counsel sent litigation hold notices to custodians and directed.

IT staff to preserve relevant backup tapes.

The preservation process performed by IT staff simply included temporarily halting tape rotations. But no one actually took the relevant tapes from IT to lock them away. In the course of time, IT ran low on tape inventory for daily, weekly and monthly back- ups. Eventually, IT put the relevant tapes back into rotation. By the time IT disclosed to in-house counsel that they were rotating backup tapes again, more than 600 tapes potentially holding relevant data from the time period under review had been overwritten. The data, which had been temporarily preserved at the direction of counsel was never collected and was eventually lost.

FORENSIC PRESERVATION OF DATA

Forensic examiners might use a wide variety of tools, technologies, and methodologies to preserve and collect the data selected by counsel, depending on the underlying data source.

Regardless of the specific tool, technology, or methodology, the forensic preservation process must meet certain standards, including technical standards for accuracy and completeness, and legal standards for authenticity and admissibility. Historically, forensic examiners have relied heavily on creating forensic images of static media to preserve and collect electronic evidence.

But more and more often, relevant ESI resides on data sources that can not be shut down for traditional forensic preservation and collection, including running, revenue generating servers or multi-Terabyte Storage Area Networks attached to corporate servers. Recognizing the evolving nature of digital evidence, the Association of Chief Police Officers has published its fourth edition of *The Good Practice Guide for Computer-Based Electronic Evidence* (ACPO, 2008). This guide was updated to take into account that the “traditional ‘pull-the-plug’ approach overlooks the vast amounts of volatile (memory-resident and ephemeral) data that will be lost. Today, digital investigators are routinely faced with the reality of sophisticated data encryption, as well as hacking tools and malicious software that may exist solely within memory. Capturing and working with volatile data may therefore provide the only route towards finding important evidence.” Additionally, with the advent of full-disk encryption technologies, the traditional approach to forensic preservation is becoming less and less relevant. However, the strict requirement to preserve and collect data using a sound approach that is well documented, has been tested, and does not change the content of or metadata about electronic evidence if at all possible, has not changed.

preserving and Collecting e-mail from Live Servers Laptop, desktop, and server computers once played a supporting role in the corporate environment: shutting them down for traditional forensic imaging tended to have only a minor impact on the company. However, in today’s Research performed by James Holley identified 59 hardware and software tools commercially or publicly available for preserving forensic images of electronic media (Holley,

2008). 4 “Static Media” refers to media that are not subject to routine changes in content. Historically, forensic duplication procedures included shutting down the computer, removing the internal hard drive, attaching the drive to a forensic write blocker, and preserving a forensic image of the media. This process necessarily ignores potentially important and relevant volatile data contained on the memory of a running computer. Once the computer is powered down, the volatile memory data are lost.

Business environment

Shutting down servers can have tremendously negative impacts on the company. In many instances, the company’s servers are not just supporting the business—they are the business. The availability of software tools and methodologies capable of preserving data from live, running servers means that it is no longer absolutely necessary to shut down a production e-mail or file server to preserve data from it. Available tools and methodologies allow investigators to strike a balance between the requirements for a forensically sound preservation process and the business imperative of minimizing impact on normal operations during the preservation process (e.g., lost productivity as employees sit waiting for key servers to come back online or lost revenue as the company’s customers wait for servers to come back online). Perhaps the most requested and most produced source of ESI is e-mail communication. Counsel is most interested to begin reviewing e-mail as soon as practicable after forensic preservation. Because the content of e-mail communications might tend to show that a custodian knew or should have known certain facts; or took, should have taken, or failed to take certain action; proper forensic

preservation of e-mail data sources is a central part of the electronic discovery process. In our experience over the last 10 years conducting investigations, the two most common e-mail infrastructures we've encountered are Microsoft Exchange Server (combined with the Microsoft Outlook e-mail client) and Lotus Domino server (combined with the Lotus Notes e-mail client). There are, of course, other e-mail servers/e-mail clients in use in the business environment today. But those tend to be less common. In the course of our investigations, we've seen a wide variety of e-mail infrastructures, including e-mail servers (Novell GroupWise, UNIX Sendmail, Eudora Internet Mail Server and Postfix) and e-mail clients (GroupWise, Outlook Express, Mozilla, and Eudora). In a few cases, the company completely outsourced their e-mail infrastructure by using web-based e-mail (such as Gmail or Hotmail) or AOL mail for their e-mail communications.

Preserving and Collecting e-mail from Live Microsoft exchange servers to preserve custodian e-mail from a live Microsoft Exchange Server, forensic examiners typically take one of several different approaches, depending on the specific facts of the matter. Those approaches might include:

- Exporting a copy of the custodian's mailbox from the server using a Microsoft Outlook e-mail client
- In older versions of Exchange, exporting a copy of the custodian's mailbox from the server using Microsoft's Mailbox Merge utility (Exmerge)
- In Exchange 2007, exporting a copy of the custodian's mailbox using the Exchange Management Shell

- Exporting a copy of the custodian's mailbox from the server using a specialized third-party tool (e.g., GFI PST-Exchange Email Export wizard)
- Obtaining a backup copy of the entire Exchange Server "Information Store" from a properly created full backup of the server.
- Temporarily shutting down Exchange Server services and making a copy of the Exchange database files that comprise the Information Store.
- Using a software utility such as F-Response™ or EnCase Enterprise to access a live Exchange Server over the network and copying either individual mailboxes or an entire Exchange database file.

Each approach has its advantages and disadvantages. When exporting a custodian's mailbox using Microsoft Outlook, the person doing the exporting typically logs into the server as the custodian. This can, under some circumstances, be problematic. One advantage of this approach, though, is that the newer versions of the Outlook client can create very large (>1.7GB) Outlook e-mail archives. For custodians who have a large volume of mail in their accounts, this might be a viable approach if logging in as the custodian to collect the mail does not present an unacceptable risk. One potential downside to this approach is that the Outlook client might not collect deleted e-mail messages retained in the Microsoft Exchange special retention area called "the dumpster," which is a special location in the Exchange database file where deleted messages are retained by the server for a configurable period of time. Additionally, Outlook will not collect any part of any "double-deleted" message. Double-deleted is a term sometimes used to refer to messages that have been soft-deleted from an Outlook folder (e.g., the Inbox) into the local Deleted Items folder and then deleted from the Deleted Items folder. These messages reside essentially in the unallocated space of the Exchange database



file, and are different from hard-deleted, which bypass the Deleted Items folder altogether during deletion. Using Outlook to export a custodian's mailbox would not copy out any recoverable double-deleted messages or fragments of partially overwritten messages.

One advantage of using the Exmerge utility to collect custodian e-mail from a live Exchange server is that Exmerge can be configured to collect deleted messages retained in the dumpster and create detailed logs of the collection process. However, there are at least two main disadvantages to using Exmerge. First, even the latest version of Exmerge cannot create Outlook e-mail containers larger than 1.7GB. For custodians who have a large volume of e-mail in their account.

CHAPTER SIXTEEN



ANATOMY OF THE COURTROOM: A LEGAL PERSPECTIVE

When the liberty of an individual may depend in part on physical evidence it is not unreasonable to ask that the expert witnesses who are called upon to testify, either against the defendant, or on his behalf, know what they are doing. Dr. John Thornton in Kirk and Thornton (1974).

The roles played by an expert forensic criminologist are wide and varied. From advising policy makers to aiding investigators, the forensic criminologist may need to be many things to many people, depending on the task at hand. However, never are the stakes so high, nor the immediate ramifications so dire, than when the expert is called to testify as to his or her opinion upon the trial of a person accused of a crime. It is in this arena where the product of the expert's craft (the evidence of the expert's professional opinion) may literally be the difference between another's freedom and incarceration. In some jurisdictions, it may be the difference between life and death. When the expert is giving evidence within a courtroom setting, his or her methods and opinions are

exposed to the highest level of scrutiny. The expert may be challenged as to the extent of his or her expertise, or forced to defend the validity of his or her chosen field of study against attacks that it is merely guesswork or irrelevant. The attack may not only extend to that of the expert's profession: salvos on his or her personal credibility may be launched with the expert forced to explain matters within his or her personal life, or historical indiscretions. It is for these reasons that experts must know not only what they are doing within their chosen field of expertise, but also when called as witnesses have some appreciation of their function and province as such. The level of professional self-awareness required can only come through an appreciation of the framework in which they are performing, the roles of others within that framework, and the use that can and will be made of the experts' evidence. By gleaning some understanding of what is required of experts and of where other experts routinely fail, it is hoped that the readers of this chapter will be better equipped to prepare themselves and hone their skills in this challenging task. While it is one thing to know what one is doing within a professional office, laboratory, or classroom, it is quite another to adequately know what one is doing when being examined and cross-examined in a court of law.

“Not Guilty” Verdict: The outcome of a jury which unanimously finds that the prosecution has failed to discharge its burden of proof. Scientific Method: A search for scientific truth through systematic observation and testing. Voir Dire: A trial within trial, reserved to be considered and determined by the trial judge only.

Any discussion of the role of the expert witness must necessarily be pared back to the stage upon which that witness is called to perform: the courtroom. Most courtrooms, whether operating under the adversarial or inquisitorial systems, have several features that are common. The judge(s) (and jury if there is one) will have a clearly delineated area, usually with a clear view of the witness box (or stand) from where the expert and other witnesses give their evidence. The parties to the proceeding will be allocated areas that will invariably face toward the judge(s) and also have clear line of sight to the witness box. The physical layout of the courtroom, though, is only one aspect of the setting. The most significant aspect of the setting is the historical and functional system under which the courtroom in question operates. In common law countries (such as the United States, Australia, and the United Kingdom), all criminal courts operate under the adversarial system.¹ In civil law jurisdictions (such as France and other mainland European countries), the inquisitorial system is favored.

The adversarial system Put simply, the adversarial system of litigation is one in which each side to a dispute puts arguments to an impartial and disinterested (as opposed to uninterested, one hopes) arbiter. The arbiter may be one who is asked to find facts, or decide on the law, or both, and come to a final decision about the dispute between the parties. The adversarial system has been applied and refined through precedent over centuries in several jurisdictions. It holds as its fundamental underpinning the philosophy that the best way to determine a dispute is for an independent adjudicator to hear and consider strong arguments on each side of the issue. It is for this reason that the adversarial system is often referred to as a contest or game between two (or more) sides with the

judge(s) acting as umpire (Fairchild and Dammer, 2001, p. 140) deciding whether each side is playing by the rules. If the individual case being litigated does not involve a jury, then the judge(s) will also be required to determine the victor. Within the adversarial system, the parties advance their case through argument and by calling witnesses to give evidence that support and tend to advance their case. At the same time the parties may seek to attack or undermine their opponent's case by demonstrating that it is flawed, misconceived, or unbelievable (Ranson, 1996, p. 29). The system is adversarial not only by name, but also by nature: a contest between two opposing sides who aim to strike blows against the other to the advancement of their case.

As well as most civil law courts, with a few exceptions such as the coroner's court and some tribunals and commissions

Critical to the adversarial system of criminal litigation is the notion of procedural fairness (also known as natural justice), which provides that the accused person is to be afforded rights² such as:

- The right to silence;
- The right to counsel;
- The presumption of innocence;
- The right to know the allegations leveled against him or her; and
- The right to face his or her accusers. It is for these reasons that the adversarial system is said to afford the accused person in a criminal trial with the most advantages. The accused's counsel will attempt to use these advantages as both weapons and shield in the battle against the prosecution. Where a dispute as to the application of these principles arises, the judge will

be asked to determine the dispute on that issue. Consistent with the rights listed previously, the rules of evidence are significantly weighed in favor of the accused person in an adversarial trial. This is to ensure, as best as possible, that the accused receives a fair trial, determined on evidence that is reliable and relevant to the issue in dispute. However, the application of these rules can be of frustration to victims and prosecutors alike. Often cogent (and relevant) evidence is excluded because its admission would detrimentally impact on the fairness of the trial. Accordingly, a trial must be determined on the evidence presented within it, and that evidence only. The discourse between a barrister (counsel) and law lord (judge) in a now famous (or perhaps infamous) passage from an English case most poignantly demonstrates the extreme application of this tenet. Murphy (2002) in his tome on evidence recounts this exchange:

A frustrated judge in an English adversarial court finally asked a barrister (counsel) after witnesses had produced conflicting accounts, “Am I never to hear the truth?”

“No, my lord, merely the evidence” replied the counsel.

THE INQUISITORIAL SYSTEM

Civil law countries, such as most of those in mainland Europe, derive their inquisitorial system of justice from the most ancient traditions of justice. Stemming from the biblical times of King Solomon through Roman practices and the Napoleonic Code, inquisitorial judges do not sit as independent arbiters. Rather, judges act as a kind of “investigator” in search of the truth. They

determine what evidence is to be taken into account in considering the dispute. The court calls witnesses on its own initiative and plays an active role in both the pretrial and trial processes.

THE EXPERT'S ROLE IN THE PROCESS: AN ADVERSARIAL PERSPECTIVE

Unlike the common law traditions of the adversarial process, the procedures and rules of evidence are much less rigorously applied in the inquisitorial system. As such, it is often said that the inquisitorial process arrives more readily at a finding of "truth," whereas the adversarial system merely results in the determination of a dispute upon the evidence presented. Perhaps for this reason a former U.S. Supreme Court Justice (Burger, 1968) made the following remark:

If he were innocent, he would prefer to be tried by a civil law (i.e., Inquisitorial) court, but that if he were guilty, he would prefer to be tried by a common law (i.e., Adversarial) court.

An expert witness within the adversarial system will almost always be called by one side or another to the litigation.³ In a criminal case this will involve the expert being called either by the prosecution or the defense, presumably to give evidence that is most favorable the side calling him or her. Accordingly, the expert witness needs to appreciate the audience to whom the evidence is to be presented. In criminal cases, this audience will most often be constituted by a jury.

Juries in the adversarial system In cases where a jury is involved, the presiding judge is asked only to determine issues of law including admissibility of evidence and fairness to the accused. This may include the admissibility of the evidence from an expert witness. Practically, the role of arbiter (or “judge”) is shared among the relevant umpires: the judge is the judge of the law, while the jury combined are the judges of the facts. To this end, the judge tells the jury as much law as they need to know to fulfill their task, determining the facts of the case in dispute. You will recall the brief discussion at the beginning of this chapter of the common features of all courtrooms and the fact that the jury (if there is one) are positioned in an area that has “a clear view of the witness box (or stand) from where the expert and other witnesses give their evidence.” The reason is that the jury’s deliberations must be based exclusively upon the evidence, and the evidence in any given criminal case will be, by far and away, mostly constituted by what witnesses say in the witness box. In a jury trial it is exclusively the function of the jury to determine what parts of the presented evidence they will rely on in determining the facts in dispute. In doing this the jury must consider the weight which they will attach to any individual piece of evidence, whether some courts have the power to call their own experts either through their inherent jurisdiction or as provided for by statutory rules. However, these powers, where they exist, should, and are, exercised only in rare circumstances.

Most criminal trials in common law countries are determined by juries; however, recent legislative amendments in some jurisdictions mean that issues as to criminal responsibility may be determined by a judge alone. These

amendments represent a significant shift in historical adversarial processes and may be indicative of a more inquisitorial approach being taken by criminal courts traditionally operating under the adversarial system.

For this reason, the jury is often given “the best seat in the house” with a clear view of the witness box (also referred to as the witness stand) so they can assess the evidence being given by a witness and the manner in which it is given, including the witness’s demeanor under cross-examination when challenged on his or her evidence. The expert Witness’s role in the adversarial system Distinct from the rules of admissibility lies the role of the expert witness in the courtroom setting. While the rules are well recorded and explained, the role is less well defined. It will vary on a case-by-case basis, but generally, the expert witness’s role is “to assist the court” in its determination of the issues in dispute. A respected English judge, Lord President Cooper, laid down the following general formulation of the expert witness’s role in his decision in *Davie v Edinburgh*

[The duty of the expert is to] furnish the judge or jury with the necessary scientific criteria for testing the accuracy of their conclusions, so as to enable the judge or jury to form their own independent judgement by the application of these criteria to the facts proved in evidence. In isolation, the utility of this formulation is limited. For one, how does one adequately identify the relevant “necessary scientific criteria”? Helpfully, Eggleston (1983) argues that the expert’s role may be satisfied by performance of four separate yet related functions:

- Generalizing from experience;
- Acting as librarian;
- Acting as statistician; and
- Acting as advocate. While this approach is not flawless, it was approved and adopted by the Full Federal Court of Australia in *Arnotts Ltd v Trade Practices Commission*.⁷ Generalizing from Experience Eggleston suggests that generalizations based on experience may be in the form of an assertion of fact or opinion. However, although the Federal Court has adopted this analysis, many noted authors in the area of expert evidence warn of the dangers of generalizing. Thornton (1997) argues that this type of assertion is based on inductive reasoning and merely results in a working assumption that may or may not be valid. Turvey (2002) states that inductive reasoning involves broad generalizations based on premises. However, while the premises themselves may be correct, the subsequent conclusion may be false.³⁹

The problems raised by inductive reasoning within the setting of a criminal trial are twofold: first, the conclusion if stated as a fact may actually be false; second, if the conclusion is stated as an opinion based on experience, often the premises are untestable. Therefore, the jury cannot assess the logic involved in drawing the conclusion, and the expert effectually usurps his or her own function and remains unaccountable. Gross (1898, p. 106) grappled with this issue as early as the late 1800s when he stated, “[T]he problem is the

³⁹ *Viva voce* is a Latin term that means “by word of mouth.” (1953) SC 34 at 40.7(1990) 24 FCR 313 at 350–1. Court comprising of Lockhart, Wilcox, and Gummow (later of the High Court) JJ.

examination of how inferences have been made by another and what value his inferences may have for our own conclusions.” The critics of inductive reasoning unanimously support its antithesis, deduction. Deductive reasoning takes the given premises and logically follows them through to the conclusion. It involves critical thinking and may be evaluated by an objective assessor. Implicitly, if the premises are true, then so too must be the conclusion. This is the basis of the scientific method. The decreased potential for false conclusions based on true premises and the increased ability to evaluate the logic from which a deductive opinion results makes it more conducive to the role of the expert witness. By providing the jury with the ability to evaluate the reasoning of the expert, the witness may necessarily facilitate his or her role as expounded by Cooper LP. Moreover, as justice should be the ultimate aim of the court, the increased reliability of deduction lends itself more convincingly, and appropriately, to the process.

Acting as Librarian One interpretation of Cooper LP’s statement may be summarized thus: the role of the expert witness is to educate the triers of fact as to things beyond their ordinary knowledge. Due to the nature of the expert’s training and experience, this knowledge may only be imparted by the expert “flagging” relevant literature through his or her testimony. Sometimes, the expert may not know the answer from his or her own experience or study but may know, as he or she is adequately skilled in his or her art, which works of authority provide such an answer. In this instance, the expert is not generalizing or inductively reasoning. Rather, as suggested by Freckleton and Selby (2002), the expert is using his or her knowledge and skill to find the answer from the

body of literature that provides the framework for his or her field of expertise. One such example of this within a criminal law setting can be found in the case of *R v Abadom*⁹ where a scientist from the British Home Office gave evidence as to the refractive index of glass found in a suspect's shoe. The glass was the same type as that found at the scene of the crime. Although the scientist was able to offer opinion as to the match, it was only through use of a table of refractive index compiled by other scientists that he was able to highlight the low probability that the two samples of glass were unrelated. By effectively bringing that table to the attention of the jury, the expert scientist fulfilled the role of librarian and the jury could ponder the fact as to whether the glass samples were from the same source.⁴⁰

Acting as Statistician in *Trade Practices Commission v Australian Meat Holdings Pty Ltd*,¹⁰ the Australian Federal Court held that sometimes the expert can only draw appropriate conclusions from statistical methods applied to material from other sources. The significance of this process to criminal trials can be observed through expert evidence related to DNA typing. The very nature of some types of class evidence (e.g., hair and fiber) and individuating evidence (e.g., DNA) lend themselves to interpretation only through statistical application. When offering an opinion based on these types of evidence, the expert, by necessity, must refer to frequency tables and offer an opinion based on statistics. Therefore, the expert's function to act as a statistician and

⁴⁰ 8See, for example, Gross (1894), Ranson (1996), Saferstein (2001), and Turvey (2002).⁹[1983] 1 All E R 364.

statistics interpreter is appropriately defined. However, this arguably applies only when dealing with evidence that requires opinions to be expressed in accordance with probabilities.

Acting as advocate The expert's final role is to act as an advocate: not for a side, nor himself or herself, but for his or her opinion and methods (Eggleston, 1983; Freckleton and Selby, 2002).¹¹ Eggleston (1983, p. 154) identifies that, in performance of this function, problems may arise due to the assumptions on which the expert may be basing his opinion. However, if he makes his assumptions clear, there is no objection to his arguing what the consequences of accepting those arguments should be; but he is not to do the jury's fact finding for it, where this depends on accepting one or other set of contradictory witnesses. In essence, Eggleston opines that where there is any contradictory evidence to the expert's opinion, if the expert has adequately fulfilled his or her other functions, then he or she may rightly advocate his or her opinion. It is interesting to note that Eggleston stresses the necessity for the expert to "make his assumptions" clear when he earlier states that the expert is to generalize from experience [see above]. Presumably, if the expert generalizes from experience without specifically identifying what those experiences are, then he or she undermines his or her ability to advocate for his or her opinion. Otherwise, the most dangerous situation arises: where the expert can advocate an opinion based on untestable premises and effectively, if not literally, decide

the issue for the judge and/or jury. This may, even in the face of contradictory evidence, be highly persuasive to a jury and decide the out- come of the trial⁴¹.

SCIENCE IN THE COURTROOM :

Any discussion of expert evidence within the adversarial system would be deficient if it failed to identify the most common impasse between the role of the expert as a witness and the role of the expert as practitioner. Due, at least in part, to the rules which govern the reception of expert evidence in a courtroom, commonly forensic experts abound from scientific fields or, at the very least, fields which are founded on the scientific method. The scientific method, at its core, is derived from a search for scientific truth, through systematic observation and testing. However, adversarial courts are less about truth than they are about proof. The level of precision which can, and is, applied in a courtroom must be less than that applied in science: while science may be founded on facts and figures, the court process is founded on evidence and proof. The latter are, without doubt, less concrete concepts than the former. The expert must always be mindful of the different respective bases of science and the courtroom when his or her work has a forensic aspect to it. The expert is asked, when called into the witness box, to measure his or her methods and conclusions by a different ruler to that which he or she is used to. “Scientific probability” is a different thing to “beyond reasonable doubt,” and any attempt to correlate the two will almost certainly lead to conceptual, if not legal, error.

⁴¹ 10(1988) 83 ALR 299. Also see *Clark v Ryan* (1960) 103 CLR 486.

Therefore, the expert must be cognizant of these divergences, and instead of trying to tailor his or her opinion to fit within the legal framework, remain faithful to his or her endeavor. Failure to do so leaves the expert vulnerable to misstatements and his or her evidence to misinterpretation. This devalues the expert's role and ultimately only confuses the court (however constituted).

Australian Criminal Procedure: an overview for experts the foundation for any litigation is laid upon the happening of a certain event. For a criminal trial, that event is the commission and subsequent detection of a crime, or alleged crime, as the case may be. A dispute which gives rise to a civil trial may arise due the occurrence of event such as a contractual breach, a false advertisement, or an act of alleged negligence. It may also arise due to the perception that something actionable will occur in the future, so the court process is invoked to stop that occurrence from happening. While the forensic criminologist's utility in the criminal trial procedure is self-evident, the role of such an expert in the civil arena may not be so readily apparent. However, depending on the subject matter of the civil litigation (also known as a suit) an expert forensic criminologist may be of assistance in not only giving relevant expert testimony, such evidence may ultimately be invaluable to the court in determining the dispute. An appreciation of the steps involved in, and related to, both criminal and civil litigation should enlighten.

THE FORENSIC CRIMINOLOGIST'S INVOLVEMENT CRIMINAL CASES

It is conceivable that an expert forensic criminologist may be involved in each and every step of the criminal process, both before the filing of the charges and after. In this sense, broadly speaking, the role of the forensic criminologist can be delineated into two categories. Either the forensic criminologist is employed to:

- Assist in the investigation or preparation of the matter for trial (investigative role); or
- Assist in the trial (evidential role). Investigating authorities may call on the forensic criminologist to assist in understanding evidence and offender behavior with a view to identifying a suspect pool and arresting a Suspect. Similarly, the defense may engage an expert criminologist during the early stages of a matter to assist the legal team to understand the evidence or to conduct other investigations, which may ultimately assist the Defendant in challenging the case brought against him or her.

Prosecuting authorities and defense alike may later call on the forensic criminologist to testify as an expert witness. Such testimony may be given at the trial, voir dire, bail application, or sentencing phase, depending on the subject matter of the evidence and the utility sought to be made of it. When called as an expert witness, the criminologist is afforded the opportunity to explain to the court what meaning, in that expert's opinion, can be made of certain evidence. Whether the forensic criminologist engaged to perform the investigative role is called to give expert testimony upon a trial will depend largely on whether the opinion furnished upon the investigation is supportive of an argument being put

forward by a particular side and is of a sufficiently probative value to justify its reception in a court.

Therefore, the roles played by the forensic criminologist in the criminal process will depend not only on the timing of his or her engagement, but also on the practical and evidential utility of that opinion. The regularity of experts' appearances in any criminal jurisdiction is largely a function of the funds made available for the defense and prosecution to engage experts. In this author's experience (practicing in several Australia federal and state jurisdictions, both in the role of prosecutor and defense counsel, as well as in international tribunals), the funds available to prosecuting authorities for engaging experts is far in excess of those available to the defense (whether privately or publicly funded). Accordingly, often courts receive expert testimony called by prosecutors, and it is for the defense to challenge that evidence without the benefit of an expert either as witness or consultant. This puts an incredibly heavy burden on the defense counsel, who is forced to challenge the bases or reasoning employed by the expert in formulating his or her opinion. This author has often observed defense counsel concede the expert's evidence or try to diminish its value before the jury by suggesting alternative hypotheses and putting to the expert that those alternatives cannot be excluded. A careful expert will usually agree that reasonable alternative hypotheses put in cross-examination cannot be excluded and may, in doing so, destabilize the jury's confidence in his or her evidence. However, a conscientious expert will often qualify his or her response to these alternative hypotheses by explaining why he or she has excluded them and why his or her opinion should be preferred.

Rash responses will come undone and may further weaken the jury's faith in the expert. But, a well-thought-out, measured response can bolster the expert's credibility and add significant weight to his or her opinion.

Other ways in which expert witnesses' evidence may be countered is to challenge the assumptions or evidence on which the opinion is based. In a recent case in which this author was involved, the cause of a serious injury was in dispute (the accused was alleged to have caused serious brain damage to a person by an assault). An expert was called by the prosecution to testify as to the likely physiological cause of the brain damage, such being the application of pressure to the carotid artery by a headlock. After several hours of cross-examination, the expert witness had excluded several other innocent hypotheses for the cause of the brain damage. He excluded these hypotheses all based on the timing of the alleged victim's display of symptoms: all eyewitnesses claimed that the victim collapsed and was mute immediately upon being released from the headlock. Following the cross-examination of the expert, closed circuit security footage was discovered which showed that the eyewitnesses' recollections were, in fact, wrong; the alleged victim was shown to be walking unaided and talking in the minutes following his being released from the headlock. Accordingly, the expert's opinion was based on false premises and his ultimate conclusion as to the cause of the brain damage was shown to be incorrect.

CIVIL CASES

Either party to civil litigation may have cause (and sufficient funds) to engage a forensic criminologist. The role to be played by the expert may be investiga-



tive or evidential (or both). The role may involve assisting the lawyers in framing the claim (or defense as the case may be) or in providing expert testimony going to the issues of liability and/or quantum.

CONSULTANT EXPERTS

A most important role that the expert forensic criminologist can play in both criminal and civil cases is that of the consultant. A consultant expert is one engaged by a party to litigation who provides advice and opinions behind the scenes. The consultant is not called by the party engaging him or her, but rather assists the lawyers in the presentation of their client's case. The consultant expert may be engaged to advise the lawyers on understanding the evidence of the other side's expert, or in devising a line of cross-examination designed to show flaws in that expert's evidence, reasoning, or methods.

PRIVILEGE AND WAIVER LEGAL PROFESSIONAL PRIVILEGE

This protects communications between the expert and the side that has engaged him or her, whether in an investigative role or evidential Role. The reason is that, in all areas discussed previously, the communications between the expert and the side engaging him or her would fall under category (2) discussed earlier: the expert has been engaged (and presumably communications are made) either with reference to litigation that, at the time of the engagement (and communication), is occurring, or is anticipated. That is not the end of it, however. Privilege is a legal right, and as such can be waived, either expressly

or by the conduct of the person who enjoys the privilege (in this case, the client). The circumstances in which a waiver might occur are varied and contentious; however, distilled down to its simplest form, waiver occurs when the client acts inconsistently with the maintenance of the confidentiality protected by the privilege (Freckleton and Selby, 2002).

As it relates to the practice of expert witnesses, and communications passing between them and one party to the litigation (including that party's lawyers), privilege is most often waived knowingly and voluntarily. The reason is that the expert engaged has communicated something to that party, usually in the form of an expert report that the party seeks to rely upon. Most Australian civil jurisdictions have rules of practice that preclude the calling of an expert witness unless the party seeking to call the expert provides the other side with a report of that expert's witness in advance. In criminal matters, in line with principles of procedural fairness, the prosecution is obliged to disclose all expert material, whether helpful or detrimental to their case, assembled in the course of the investigation (Freckleton and Selby, 2002), whether or not it is intended that the evidence will be relied on at the trial. Depending on the jurisdiction, should the Defendant intend to call an expert witness upon his or her trial, advanced disclosure as to the expected evidence of that witness is required in the form of an expert report.²¹ Whether discovery of an expert's report is mandated by statute or the rules of court or simply by the willful calling of an expert as a witness, a party will waive the protection of privilege. The waiver, however, will not necessarily apply to all communications between that expert and the side calling him or her. The extent is determined on a case-by-case basis. As a

rule of thumb, though, all communications forming the foundation (or part of the foundation) of the expert's opinion are waived when the contents of the opinion are waived. These communications may include letters passing between the expert and the party, the expert's notes, or earlier drafts of the expert's report or letters of opinion. The significance of waiver for the forensic expert is clear: any communication forming the part of the foundation of the opinion will be waived when privilege over that opinion is waived.

GENERAL PROBLEMS WITH EXPERT EVIDENCE :

Freckleton, Reddy, and Selby (1999, 2001) conducted two national surveys for the Australian Institute of Judicial Administration which required members of the judiciary, both judges and magistrates, at all levels to state their opinions on expert evidence. The results of these surveys were published in two separate reports, one covering magistrates' responses and the other covering the judges'. Through this survey, Freckleton et al. attempted to identify recurring problems presented by expert evidence. The surveys were presented to 478 judges and magistrates across all Australian jurisdictions. Of the 478 survey candidates, only 244 (51.5%) responded by completing the survey. Therefore, although the results may be skewed by the reluctance on the part of some to participate, a response and sample size of 51.5% still provides a sound basis for statistical reliability.

Several specific problems were identified. However, analyses of the majority of response highlighted endemic problems.

Complexity

Given the nature of expert evidence and the rule that requires the evidence of an expert to be beyond the experience and knowledge of the judge or jury, it is often quite complex. Identifying this potential problem, Freckelton focused much of his study on the difficulties in comprehending the evidence of experts. Of the Magistrates who responded, 52.28% stated that they had experienced difficulty in comprehending the evidence of expert. Similarly, 46.81% of responding judges indicated that they too had difficulty in this area. The greatest reason suggested by all respondents was the complex nature of the evidence. Of all those who had responded positively to experiencing difficulty in comprehending the evidence of experts, 96% indicated that they occasionally had difficulty in this area, with 4% stating that this occurred frequently. The problem areas identified and ranked in order of complexity by the respondents were:

- Psychiatric evidence;
- Psychological evidence; and
- Scientific evidence.

Alarming, with respect to criminal trials, these are the areas that most often require expert opinion. The obvious concern in this respect is the jurors' comprehension of the evidence, especially in criminal trials where an individual's liberty may be in the balance. If the judges and magistrates are unable to understand the evidence, and this is the type of evidence they are exposed to daily, then how can the jury be expected to comprehend, evaluate, and form their own view of the evidence? The studies revealed that problems in comprehending the complex evidence of experts stemmed from the confusing

and convoluted language used and the failure of experts to explain the bases of their opinions. Of greater concern though was the indication that poor examination in chief and cross-examination by counsel was most often a significant factor in confusing the court. This raises the issue of the role and responsibilities of the advocate where expert evidence is called.

Field of Expertise

Around three-quarters (77.3%) of respondents indicated that experts occasionally stray out of their area of expertise and offer opinions which are beyond their capacities to make. It is concerning to further note that more than one-tenth (11.4%) of respondents were of the opinion that this occurred frequently. This suggests that there is a large amount of “opinion” evidence which is being heard in court that affronts the rules of evidence. The consequence of this is that a virtual non expert is purporting to give an “informed and helpful” opinion in an area which exceeds his or her field of expertise.

Bias

Due to the nature of our adversarial system of justice and the way in which experts are called by one side or another and not the court, it is implicit that the parties and their lawyers will call only experts who support their case. Moreover, it is the parties who decide (obviously limited by financial constraints and the rules of court) how many experts will be used, on what issues they will be called to testify, and the timing of disclosure of the experts’ evidence. This inevitably may result in bias on the part of the experts. The role of the expert includes acting as an advocate, not for a side, but that side’s

opinion. However, economic ties between an expert and the lawyers who frequently call him or her the expert may result in the expert ceasing to act as an advocate of his or her opinion. The expert may then veer into the realm of becoming a witness for hire. This encourages, even if subconsciously, the expert to over assert his or her opinion, wander into areas beyond his or her expertise, and sometimes totally undermine his or her professional standards and procedures. In a criminal case in which this author recently appeared, two “independent” experts gave evidence for different sides, each giving evidence about the way in which a complicated piece of machinery worked, and their opinions on whether such worked properly on a day in question. At the conclusion of both experts’ evidence, the magistrate (sitting as judge of the law and facts) seemed equally persuaded by each expert. In turn, the judge had each expert recalled to give evidence about his respective experiences in appearing in court. The first (prosecution) expert stated that he had given evidence in hundreds of cases on behalf of the prosecution across many jurisdictions. The other expert replied that this case was the fourth in which he had given expert evidence, and only the first time he had given evidence for the defense. Contrary to expectations, but perhaps in accordance with some assessment of latent bias, the judge decided the case in favor of the defense. Freckelton’s surveys revealed that 35% of respondents cited bias as one of the major problems arising from expert evidence. Many complained about seeing the same experts appearing only for the same side in cases (i.e., only for the prosecution or only for the defense).

Certainly, if this is the case, then it must be questioned just how many experts are functioning merely as advocates of their opinions and not advocates for a side, or even a paycheck. The structure of government crime laboratories and forensic services in some jurisdictions will no doubt lead at least to the inference of “opinion for hire.” The arrangement of dedicated prosecution and defense services no doubt lends itself to some perceived (if not actual) bias on behalf of experts: they are actually employed on a full-time basis by the police or the prosecuting authority or they are engaged exclusively by the defense. If justice is not only to be done but also to be seen to be done, then experts operating within such structures must, at the very least, comply with the highest principles of their profession, with ethics and transparency. Otherwise, their opinions, their evidence, and ultimately their credibility will be worthless, in court and elsewhere. The problems arising from expert evidence are equally as vast as they are concerning. The fact that the judiciary is often confused by the testimony of experts leads one to ponder the extent to which the same perplexity affects jurors. Moreover, the underhanded inclusion of otherwise inadmissible evidence under the guise of an inappropriate expert opinion threatens to undermine not only the laws of evidence, but also the entire justice process. Contributing to this is the apparent bias of “guns for hire” who seemingly abandon their science and become some kind of testamentary mercenary for one side or the other.

Accountability of the expert in matters of opinion

I very much distrust expert evidence, for several reasons. In the first place, although the evidence is given upon oath, in point of fact the person knows he

cannot be indicted for perjury, because it is only evidence as to a matter of opinion. So that you have not the authority for legal sanction [sic]. A dishonest man, knowing he could not be punished, might be inclined to indulge in extravagant assertions on an occasion that required it. Sir George Jessel MR in *Lord Abinger v Ashton* (1873)²³ The question of whether an individual offering opinion evidence may be held criminally liable for deliberately misleading the court has been controversially discussed through a string of older common law decisions (Freckleton and Selby, 2002, p. 573).²⁴ Freckleton and Selby (2002, p. 573) and Hodgkinson (1990, p. 215) argue that an expert should be held liable to penalties of per- jury if he or she gives sworn evidence of an opinion not truly held by him or her. Nonetheless, due to the nature of an opinion, establishing the elements of perjury to the criminal standard of proof would be most difficult.⁴²

Civil liability of an expert's opinion is protected to the extent of any witness. Policy demands that all witnesses enjoy an unqualified immunity from civil suit in regards to things they say in the witness box even if it is false or mali- cious. Experts also enjoy a level of immunity for work done in preparation for trial analogous to the immunity enjoyed by the advocate. Distinction must be made between assertions of fact and assertions of opin- ion. With respect to experts, Thornton (1997) qualifies this as the difference between observation and interpretation. He differentiates between the two (p. 15): while observation may

⁴² 2317 LR Eq 358 at 374. See, for example, *Adams v Canon* (1621) 73 ER 117; *Folkes v Chadd* (1782) 99 ER 589; *R v Pedley* (1784) 168 ER 265; *Lord Arbinger v Ashton* (1873) 17 LR Eq 358; *R v Schlesinger* (1847) 116 ER 255.

be tested, proved, and equated, interpretation is the mental process of giving meaning to an observation based on deductive processes. If the expert thoroughly executes his or her function in performance of his or her role, then the trier of fact may adequately assess his or her interpretation. Essentially, observations provide the facts on which the expert is then able to deductively produce his or her interpretation (opinion). With respect to analyzing the liability of experts and their evidence, a clear distinction must be made between these two separate factors. In theory, just as a lay witness may be held accountable for giving false evidence of fact, so too may an expert. Should the expert say he or she has seen or done something that he or she has not seen or done, that person should feel the full weight of a perjury prosecution. However, as to his or her interpretation (or opinion), proving the expert does not actually hold a belief to which he or she attests may fall into the realm of impossibilities. Therefore, notwithstanding academic opinion, the practicalities of holding an expert criminally liable for offering a false opinion will probably only remain contentious in the minds of scholars. Currently, the accountability of the expert and his or her conduct in relation to litigation is most adequately enforced by professional regulations. The rules of evidence require expert opinion to come from some recognized field of expertise. As stated by the U.S. Supreme Court in the leading case of *Frye v United States*:

The body of knowledge from which an expert testifies must be sufficiently established to have gained general acceptance in the particular field to which belongs. In most circumstances this rule will have the ancillary benefit of providing some form of accountability for the expert whether through peer

review, professional standing or, if some organized professional body exists in that field, through professional conduct sanction. Courts favor expert witnesses who belong to professional regulatory bodies because the level of accountability of that expert can be viewed as higher than the nonregulated professional. The threat of professional sanction may help curb extravagant assertions and unethical conduct by the expert and assist the court to a greater degree in its pursuit of unbiased opinion. Many professional bodies have codes of ethics to which all members are required to comply. Only through the aggressive enforcement of these guidelines, codes, and regulations can experts be held accountable for their actions.⁴³

THE ROLE OF COUNSEL

Experts are the most important auxiliaries ... everything depends upon knowing how to make use of them. Indeed, it is often less important to know who is to be questioned than to know how, upon what, and when questions must be put. Dr. Hans Gross (1894) in *System der Kriminalistik*, The Freckelton et al. study (see earlier) found that experts' evidence is confusing to judges (and presumably jurors) often due to poor examination in chief and cross-examination by counsel (see earlier). Therefore, whether it be the confusion stemming from inadequate questioning or a miscarriage of justice which ensues, the role of the advocate dealing with expert evidence must be considered. Many rules govern the conduct of advocates at trial. In Australia,

⁴³ 25Cabasi v Villa (1940) 64 CLR 130. 27(1923) 295 F 1013. Palmer v Durnford Ford [1992] 2 WLR 407 at 412 per Tuckey J. 73The Role of Counsel

both common law and the barrister's rules provide limitations and impose duties on advocates. In *R v Dick*²⁹ it was established that an advocate may not merely rely on textbooks in preparing and presenting his or her arguments in court. Specifically, the duty of the advocate is to know what he or she is talking about. While this in theory may extend to all matters in dispute, including the evidence of an expert, in practice this principle extends merely to advocates' knowledge of the law. The rules governing disclosure of expert witnesses at criminal law are somewhat less stringent than those that exist in the civil realm. As observed by Lord Justice Woolf (1996), expert evidence may, and is, used as a weapon by litigators to take advantage of the other side's lack of resources or ignorance. Therefore, the use of expert evidence in this "weapon" capacity coupled with the advocate's duty to be knowledgeable about the facts in dispute place the advocate in an unenviable position. The advocate may best serve his or her client and the court by first and foremost preparing for court thoroughly. This will include preparing the witness as well as having the witness prepare the advocate. By truly understanding the theory, procedures, and conclusions which are utilized by his or her witness, the advocate may be most effective in having the expert's opinion presented to the court. This witness preparation should include a thorough description of the expert's role, including the specific functions which he or she must execute to fulfill that role. A brief overview on the rules of expert evidence and a synopsis of the

courtroom procedure may assist all in ensuring an increased cogency of the expert's evidence.⁴⁴

The advocate may need the expert's help in developing the order and content of questions that he or she is to ask in an attempt to determine how best to approach the evidence.

Similarly, receiving expert advice in designing a cross-examination of an opposition expert may assist the advocate in gaining clarity and spotting the weaknesses of the opposition expert's evidence. The duty to be knowledgeable that falls on the shoulder of the advocate is an onerous one. Not only must counsel be versed on the law, but he or she must also be familiar with all the facts and science of the case at hand. Realistically, the only way that counsel may duly perform this duty to both the client and the court is to ensure that he or she thoroughly prepares the case. This will most often be achieved only through consulting an expert who is not to be called as a witness. The consequences of simply accepting an opposing expert's opinion without putting it to proof may have dire consequences for the client. A thoroughly prepared cross-examination of an expert may, however, be devastating to the side calling the expert.

This author has seen skillful counsel, through clever and careful cross-examination, effectively turn the other side's expert into an expert for his or her client. In a case involving charges related to the cultivating of a large cannabis

⁴⁴ For example, see Baeza, J. J. et al. (2000) "Academy of Behavioural Profiling: Criminal Profiling Guidelines," *Journal of Behavioural Profiling* vol. 1 (1 January) rr 2.2, 2.3, 3.0, 3.1. 29(1982) Tas R 252. Chapter 2 anatomy of the Courtroom: a Legal perspective

crop, a prosecution expert gave evidence of the projected trafficable quantity of cannabis. The Accused admitted to growing the crop but denied that he had intended to grow so much: that point being the difference between two charges of differing severity. While the sole issue for the jury's consideration was the total amount (by weight) the accused had intended to grow, the expert gave evidence that based on the total weight of the crop (undried and including the weight of the stems, leaves, and buds of the plants), the trafficable yield was but a fraction of the crop's overall weight. This fraction was arrived at by, among other things, reliance on empirical studies which had been conducted on the water loss (cannabis usually being smoked by its users in a dry form) in cannabis plants of a similar maturity and size. From the projected trafficable weight, the street value of the crop could be estimated based on price per weight of dried cannabis leaves and buds. At trial, defense counsel relied on an admission that his client had made to police regarding his expected yield from the crop (which was significantly less than the expert's evidence as to the expected yield based on calculations and the studies). When the expert was called, defense counsel cross-examined the expert as to the process he employed to reach the expected trafficable yield of the crop. The defense then suggested that such methods were equally accurate when hypothetically applied in reverse (i.e., starting with the yield and working back to overall crop weight), to which the expert agreed. Using the estimated crop yield as given by the Accused in his interview to the police and asking the expert to perform the same calculations in reverse, the defense was able to use the prosecution expert to advance its case: that the Accused had not intended to grow such a big crop.

The aim in doing so was to downgrade the charge from one which carried a maximum penalty of 25 years' imprisonment to one which carried a maximum of 15 years.

COURT IS NOT A PLACE FOR SURPRISES: THE IMPORTANCE OF DIALOGUE

In preparing for court, the expert witness and advocate have no better friend than each other. The expert is expert in the field in which he or she is about to give his or her evidence, and the advocate is an expert in the setting in which the expert is about to give his or her evidence: the courtroom. Each can learn much from the other and make the experience one that does not necessarily have to end in tears. The first, and often most significant, hurdle to an effective dialogue between the expert and advocate (and then, in turn, all that follows) is the fact that, professionally, both are usually from very different worlds. Each world is governed by its own protocols, rules of conduct, truisms, and jargon. Unless the advocate has some understanding of these elements, his or her ability to adequately engage in a dialogue will be severely hampered, as will the expert's. It is for this reason that, where possible, the expert should dispense with the jargon and engage in a dialogue with the advocate, in as plain language as possible. Equally, the advocate must explain his or her expectations of the expert and the function and role of the expert's evidence in plain language. The two specialized professionals must find a common ground, such more often than not being plain language. All too often professionals of all disciplines hide behind the traditions and exclusionary language of their

respective specialties, either deliberately or not, to avoid challenge. In the context of preparing for court, this is a luxury both the expert and advocate can ill afford. A challenge to the expert's rationales and conclusions should be expected, and trite defenses will come unstuck. So the first step in preparing for court must be a frank, simplified (but not overly simplified) dialogue between the expert and advocate. For the advocate it is important to remember that the expert is a witness, and like every other witness is unlikely to be as familiar with the court setting as the advocate is.

To this end, beyond the mere machinations of the evidence, it is important for the expert and advocate to discuss the impending experience. It is important to prepare, even the experienced expert witness, for what the expert can expect of the court and what the court expects of the witness. Freckelton and Selby (2002) provide 10 points of advice to the expert witness before court:

1. If unfamiliar with giving expert testimony, go and watch someone else do it first.
2. Sit or stand in the witness box and address your answers to the jury or, if there is no jury, to the judge.
3. Dress appropriately.
4. Be aware of the impressions you are making. Take care not to appear arrogant, flippant, hostile, or evasive.
5. Listen to the questions carefully and ensure you understand them before answering.
6. Be as clear, precise, and confident in your answers as the strength of your views permit.

7. If you cannot answer a question, then say so and explain why. Offer to redress the situation if possible.
8. Make sure you are aware of the factual and legal issues that invite your involvement.
9. Convey your views with whatever visual aids you believe will best assist your giving of evidence.
10. Do not misconstrue any question asked as a request to take a particular stance on an issue.

While this is a helpful checklist, there is one tenet above all else which may best encapsulate the role of the expert and ensure the expert does not waste his or her and the court's time: do not forget your audience. Whether before a jury or a judge sitting alone, the expert is called upon as a witness to assist the court. The reason is that the expert has specialized knowledge accrued through years of education, training, and experience which the judge or jury do not have. The expert has been called upon by a party to explain how that knowledge can enlighten those deciding the case. It is almost axiomatic that the subject matter of the expert evidence will involve at least some concepts which are complicated for the uninitiated to grasp. Accordingly, the message must be given in a palatable form. Advocates are often criticized for trying to dumb-down expert testimony, of reducing it to a simple string of "yes" or "no" questions. While this may be a tactic engaged to reduce the evidence of the expert to a nonsensical level, it may also be a legitimate tactic employed so that the jury may understand the complex evidence of the expert.

As can be seen by common difficulties experienced by judges and magistrates when dealing with expert evidence, so too it can be expected that juries struggle with the digestion of the expert's evidence. It is the expert's responsibility, as much as that of the advocate, to ensure that his or her opinion is understood. The first step in ensuring that the expert's opinion (if not the basis of the opinion and methods in reaching it) is understood by the jury involves ensuring that the party calling the witness understands the opinion. One may say, well, why would a party call an expert unless he or she understood the expert's opinion? Well, it happens. Sometimes the expression of the opinion is so convoluted that the opinion itself is open to interpretation; other times the expert provides several opinions, and the party seizes on one that is favorable without fully analyzing the rest. Most frequently, when this issue arises, the expert's opinion is based, at least in part, on an assumption which later proves false and undermines the opinion, or reverses its effect entirely. The necessity for the party calling the expert to understand the opinion has four desired effects:

1. If the expert can explain the opinion and its bases to the party calling him or her, then the expert has already turned his or her mind to and achieved a "layman's" explanation of the evidence.
2. The advocate examining the expert has a clearer understanding of the evidence he or she is eliciting and, one hopes, will not lead the jury into confusion.
3. The advocate will be better placed to cross-examine any expert called by the other side.

4. The advocate will be in a better position to argue the merits of his or her expert's opinion, why it should be utilized in determining the case, and why it should be preferred over the other side's expert. The dialogue between the expert and the side relying on his or her professional opinion goes beyond the mere educating as to the science and logic employed. The expert has a professional and ethical obligation to be cognizant of the weaknesses in his or her theory and to convey these honestly and openly. The identification and thorough discussion of areas where the expert's evidence is most vulnerable to attack will best prepare both the advocate and the expert. Whether the expert's opinion is reached through novel methods or based on assumptions (or even assumptions drawn on assumptions), the expert should have enough professional awareness to understand from where the likely criticisms are to come. It is these areas that should be identified and justified, if possible. Only then can the advocate make an informed decision about whether to deal with them in evidence-in-chief or wait for the attack to come and redress the issue in re-examination.

Depending on the nature and number of these disclosures, the advocate may make the informed decision not to call the expert to give evidence. However, this does not mean that an expert should be professionally arrogant for fear of affecting his or her livelihood. In practice, it is the conscientious expert, the expert who can identify the weakness in his or her opinion, who will be preferred by litigators. Advocates dislike surprises in court, especially when those surprises come from their own expert for the first time under cross-examination. Finally, like any other witness, the expert witness is a human

being. Throughout our lives and careers, we all make mistakes which we would prefer to forget. Sometimes these regrets have a way of cropping up when witnesses, even expert witnesses, are in the witness box. Unlike the nonexpert witness, the expert witness's regret may be a little more well known, either because it occurred professionally or because the legal community is a small one and, once revealed, the regret has a habit of resurfacing time and again. An expert who has been discredited or caught in a lie (even if not subjected to perjury charges) while giving evidence will expose himself or herself to cross-examination on that past occurrence every time he or she steps into court. One can be assured that opposing counsel will research not only the expert's opinion, but the expert himself or herself, including past cases in which that person has given evidence and publications he or she has authored. The expert witness need not only be mindful of this, but also ensure to raise these matters with the side calling him or her to give evidence. Failure to do so may be devastating not only to the person who engaged the expert, but to the professional future of the expert witness.

After one reviews this chapter, it should now be clear that expert forensic criminologists have wide and varied roles, and they have many issues to tackle in each of these roles. Forensic criminologists can work under the inquisitorial system or the adversarial system, depending on the jurisdiction. They can be called either by counsel or by the judge himself or herself. For forensic criminologists to be useful and successful experts in court, they need to be aware of the role of the judge and the jury in both criminal and civil trials. It must also be clear to them the difference between the procedural stages that

they may be involved in while working on a case, including the investigation, committal, the trial, and plea phases, as well as bail applications and voir dire hearings. Forensic criminologists working as expert witnesses, or any expert in the adversarial system for that matter, may be called upon to perform one or more of four separate but related functions. They may generalize from their experience to educate the court, act as librarians in directing the courts attention toward relevant literature, act as statisticians, and ultimately act as advocates for their opinion. When they carry out these functions, it is crucially important that they understand how science applies in the courtroom, that their scientific goals are not necessarily in line with the courts' search for proof and evidence, and that scientific probability does not equal proof beyond a reasonable doubt. Forensic criminologists may also be involved with litigants as consultants, during the investigative phase, or during civil cases. Regardless of the specific role criminologists play, they must be keenly aware of issues related to privilege and waiver as discussed previously. By outlining the problems with expert evidence according to those working in the court, it should become clear that criminologists giving evidence need to remember who their audience is. Complex information needs to be presented clearly in a jargon-free manner, and experts must never step over the boundaries of their expertise. Maintaining a dialogue with counsel will be of great assistance to experts, allowing them to present their opinions clearly and concisely and address any problems which may be inherent in their testimony. The goal of this chapter was to allow forensic criminologists to be better informed as to what they should expect when entering into the court setting. Armed with the

tools outlined in this chapter, each criminologist should be better equipped to assist the court in his or her area of expertise and more prepared to do so when the opportunity arises.

FORENSIC SCIENCE AND CRIMINAL PROSECUTION

I. Scene of Occurrence

A scene of occurrence is the meeting place of the persons involved. The parties exchange traces with one another and with the scene, leave odds and ends and mark of tools, wearing apparels, means of transport, hands and feet. Thus the scene of occurrence provides a wealth of information which is useful to: 1. Establish corpus delicti 2. Provide link between the criminal, the victim and the scene of occurrence; and 3. Evaluate the pattern of events. The scene is of great importance in almost all crimes except perhaps in cases of forgery where the utility is limited. The examination of the scene needs planning, care and diligence. In many cases the success or failure of the investigation depends entirely upon the proper handling of the scene.

The scene of occurrence changes rapidly and cannot be preserved forever. Some of the evidence gets lost soon after the occurrence, the other evidence disappears, gets contaminated or altered with further passage of time. The opportunity to examine the scene is available only once. If the same is not fully exploited the wealth of information is lost for ever.

Raghunandan v State of U.P⁴⁵

In the above case both the trial court as well as the High Court had brushed aside the objection that the blood recovered from the place of occurrence was not sent for chemical examination. The failure of the police to send the blood for chemical examination is a serious case of murder, such as the one before us. is to be depreciated. In such a case the place of occurrence is often disputed.

Marachalil Chandra Tukaram Talekar v State of Gujrat⁴⁶

Identity of the scene: It was argued with great vehemence in the High Court as well as in the court of sessions that there was trial of blood from the front door of the house of the vakil into the corridor rooms marked H and H-1 in the plan and that supported the defence theory that the deceased Kannan received the stab injuries not in or near the house in question but somewhere far away near the railway station. The High Court took the view that if Kannan had received the injuries somewhere outside the house it was impossible for him to have come into the room in view of the doctor's evidence.

It was concluded on the material placed on the record that there could be no room for doubt that Kannan received the injuries in the room itself and not outside, and that he was carried out of the room while life was still lingering and therefore there would be dripping of the blood from the body during the

⁴⁵ Raghunandan v State. Of U.P., 1974 Cri. L. J. 453 (S.C)

⁴⁶ Marachalil Chandra Tukaram Talekar v State of Gujrat. 1980 Cri. L.J.5 (Guj)

course of transit as the injuries were very serious and vital arteries had been cut.

FINGERPRINTS

The identification of criminals through fingerprints was the first important break-through in the scientific investigation of crime. As usual, the judiciary and the public took some time to believe in the utility of fingerprints as a scientific aid. The same is now recognized throughout the world.

The importance of fingerprints in criminal investigation is immense, because they are:

Unique Ridge pattern of each finger has individuality. The patterns vary not only from one individual to another, but they are different in the same individual on each finger. Duplication of pattern has never been observed. Nor the same is expected.

P e r m a n e n t

The fingerprints of an individual do not change throughout his life. In fact, the ridges appear before birth. They start appearing during third or fourth month of pregnancy. They remain even after the death of the individual ever till the epidermal skin is destroyed by fire, putrefaction or is eaten by insects or other creatures.

In a murder case the body of the victim was partially burnt and buried. The same was discovered many days after the murder. The body was completely disfigured and could not be identified. The investigating officer removed the

remaining skin pieces from the tips of the fingers through a doctor. He sent them to fingerprint bureau along with the one authentic print of the deceased available on his will. The bureau confirmed the identity of the deceased. The digital skin pieces were recovered and sent to the finger print bureau. The fingerprints of the deceased tallied with the fingerprints of the convict, available in the records. The permanence of fingerprints permits identification of an individual even after many years, if his finger print record is available. Many criminals have been identified through this medium after years of absconding.

Universal All individuals and hence all criminals carry this medium of identification. The finger digits and palmar surface of the hands carry the friction ridges. The fingers have more intricate patterns. They allow easier individualization and classification. A criminal uses his hands in the commission of crime. He leaves marks at the scene of occurrence or on the objects which come in contact in the commission of crime. There are fair chances of occurrence of fingerprints, therefore in all types of crime. Inimitable Successful forgery of fingerprints has not been reported so far. Near perfect forgeries have been attempted. It is possible that the advancement of science may bring the forgery still closer to perfection but complete success in the enterprise is extremely difficult, if not impossible. For all practical purposes it may be taken that it is not possible to forge a fingerprint. This is important because no person can deny his or her fingerprints. The identification through fingerprints is certain and infallible.

C l a s s i f i a b l e

The scope for classification of fingerprints is large and yet the work is simple. Records of millions of persons can be classified and kept on microfilms. Computerisation of fingerprint record, and hence searches are becoming popular and is increasing the efficiency. A search can be made virtually in seconds with the help of these devices.

Sufficient Evidence 1 The question was raised before the sessions Judge as to whether a conviction can be based upon the unsupported testimony of a fingerprint expert. There is no rule of law on the point; it is merely a matter of caution whether a court will act on such unsupported evidence or not. The correct principle was defined by S.K. Ghose, J in **Hatendra Nath Sen v Emperor**.

“I do not think that it can be laid down as a rule of law that it is unsafe to base a conviction on the uncorroborated testimony of a fingerprint expert. The true rule seems to me to be one of caution that is to say, the court must not take the expert’s opinion for granted, but it must examine his evidence in order to satisfy itself that there can be no mistake and the responsibility is all the greater when there is no other evidence to corroborate the expert”

U N C O R R O B O R A T E D E V I D E N C E

In **Bazari Hajam v King Emperor**⁴⁷ the question arose whether it will be safe to act on the uncorroborated testimony of the fingerprints and declare the guilt of the accused. On this point Bucknill, J., observed thus:

⁴⁷ Bazari Hajam v King Emperor(AIR 1922 Pat.73 :23 Cr. LJ 638)

“ I think that apart from the fact that I should be rather sorry without any corroborative circumstances to convict a person of a serious crime solely and entirely upon similarity of thumb marks or finger prints, the very fact of the taking of a thumb-impression from an accused person for the purpose of possible manufacture of the evidence by which he could be incriminated is in itself sufficient to warrant one in setting aside the conviction upon the understanding and upon the assumption that such was not really a fair trial.”

The above view was disapproved of by Schwabe, C.J. in **Public Prosecutor v Kandasami Thevan**⁴⁸ although the point did not directly arise in the case as there were thumb-impressions of the accused in evidence other than that taken by the judge in court for comparison with the thumb-impressions in the document alleged to have been forged.

Track Marks

The culprit approaches, stays and then leaves the scene of occurrence. He leaves track marks on and around the place in the form of prints and impressions (collectively called ‘marks’) of feet, shoes, tyres, hoofs and the like. The evidence often connects the criminal with the crime conclusively. It should, therefore be properly understood, collected, evaluated and presented in the courts. The track marks establish not only the presence of the culprit at the scene of crime but also give the number of participants. The evidence is helpful in tracking down the criminals to their houses or hide-outs, especially in India

⁴⁸ Public Prosecutor v Kandasami Thevan (AIR 1927 Mad. 696 :27 Cr. L. J 1251)

where most of the people live in rural areas. The roads in the country side are not metal led. Besides, the criminal, ordinarily, follows untrodden routes; fields, garden and stream beds. He leaves track marks on routes used before and after the commission of the crime.

The nature of the vehicle used in the commission of crime whether it is a cycle, scooter, car, bus, truck, tractor, rickshaw, bullock cart or a buggy can be ascertained. It is sometimes possible to identify the individual vehicle also. In some cases, animals are involved in crimes sometimes. For example, a horse or a camel may be used for transport; a cow, a buffalo or a bullock may be stolen or a dog or a tamed wild best, like a snake or a tiger may be used to destroy or kill a human-being or a domestic animal. The type of the animal or the beast can be found out from the track marks. Foot Wear marks include the marks of shoes, sandals, chappals, socks and the like. The footwear may be factory-made or hand made.

There is Case Laws Rejecting the contention that the study of footprints is not a science in **Din Muhammad v Emperor, Central Provinces Police Gazette dated 27th May , 1914 pp. 125-130, the court of the Judicial Commissioner at Nagpur (H.J. Stanyon and H.F. Hallifax, A.J. Cs)**⁴⁹ as far back as in 1914 held:

“The knowledge of footprints has similarly been systematized and pursued by trackers, mainly uncivilized and ignorant people and all other respects, all

⁴⁹ Din Muhammad v Emperor , Central Provinces Police Gazette dated 27th May , 1914 pp. 125-130, the court of the Judicial Commissioner at Nagpur (H.J. Stanyon and H.F. Hallifax, A.J. Cs)

over the world. The matter is therefore undoubtedly a science and the opinion of a person specially skilled in it is a relevant fact, under Sec-45 of the Evidence Act “

In *Re Paramban Manmmadhu*, which is a bench decision of that court, delivered by Horwill, J (Supra) the learned judge held that opinion of a foot print expert is not admissible as evidence. In the case of *Pritam Singh v State of Punjab*⁵⁰ there is an observation to the effect that the science of identification by footprints is a rudimentary science and much reliance cannot be placed on the result of such identification.

Poisons

Poisons are frequently involved in homicidal accidental or suicidal deaths. They are sometimes used to destroy animals and plants. The detection of poisons and their identification is an important aspect of forensic science. The investigation of cases of poisoning is one of the most difficult tasks. The quantity of a poison required to kill a victim is extremely small in some cases. For example, the fatal dose of nicotine is about 50 milligrams.

The investigation is further complicated by the variety of poisons available. The ever- increasing number of synthetic drugs which are used as poisons is further adding to the complications. Some drugs are very close to one another in their chemical and physiological behaviors. Their identification requires the most fined analytical techniques. Body materials in which the poisons are found, is a complex mixture of organic, inorganic and biological substances. They interfere in the isolation, detection and estimation of the poisons. In fact,

⁵⁰ (AIR 1956 S.C. 415)

the most difficult task of a toxicologist is to isolate the poison in pure form.

Once it is done, it is comparatively easier to identify and estimate the quantity.

An analysis of some of the poisons which can prove detrimental is as follows:

1.0 to 2.0g of root 1 to 5 hours Alcohol (Absolute) 250 to 500 ml A few hours

Arsenic 0.13 to 0.2g Half to 2 days

Caustic alkali 14g within 24 hours

D.D.T 2g onwards A few hours to few days Mushrooms Uncertain One day to several days.

Nicotine 0.06g A few minutes.

Oxalic Acid 4 to 16g A few minutes to a few hours

Quinine Uncertain A few minutes to several days Sulphuric Acid 4ml A few minutes to several weeks.

Zinc phosphide 0.8g within a day'

The essential ingredients in a case of poisoning are no longer in doubt. The matter is concluded by a series of Supreme Court decisions. In **Anant Chintaman Lagu v State of Bombay**⁵¹ their lordships pronounced that the prosecution establishes three propositions in a case of poisoning:

- i) Death took place by poisoning;
- ii) Accused had the poison in his possession; and
- iii) Accused had the opportunity to administer poison to the deceased.

In **Emperor v Shetya Timma**⁵²

⁵¹ Anant Chintaman Lagu v State of Bombay (AIR. 1960 S.C. 500)

⁵² Emperor v Shetya Timma(AIR 1926 Bom. 518)

The death was caused by Dhatura poisoning. After review of conflicting decisions on the point, their lordships held that where the accused administered Dhatura poison to five men in order to facilitate commission of robbery and in consequence thereof three men died, the accused must be presumed to have knowledge that their act was so dangerous that it was likely to set aside. The same view was taken in Emperor v Chattarpal⁵³.

Forensic Science and Sexual Offences

Most Serious common sexual offences are:

Rape · Incest · Unnatural offences.

Some minor sexual offences are: 1. Exhibitionism 2. Sadism 3. Frottage 4. Voyeurism-‘Peeping Tom’

Certain sexual aberrations are:

1. Masochism- This is the tendency to derive sexual gratification from one's own pain or humiliation

2. Transvestism-is the practice of dressing and acting in a style or manner traditionally associated with the other sex.

3.Fetishism- compulsive use of some object, or part of the body, as a stimulus in the course of attaining sexual gratification, as a shoe, a lock of hair, or underclothes.

In all the above cases Forensic Science play a major role in understanding the nature and gravity of the concerned crime.

⁵³ Emperor v Chattarpal(AIR 1930 Oudh 502)

EXPERT EVIDENCE

Earlier, the Courts required expert evidence to some limited field i.e. medical doctors, engineers, architects, stockbrokers etc. With the vast development in science and technology, the need of expert opinion/evidence has now become very common as well as helpful to the Courts to reach upon a fair conclusion regarding commission of an offence. Today the role of experts has been widened and the Courts take their assistance in various aspects viz. ballistic experts, forensic experts, scientists who decide the legitimacy by DNA tests, chemical examiners, psychiatrists, radiologists and even track-dogs are playing a vital role in investigation of crimes and their evidence is admissible in the court of law.

When there is some technical issue or such issue which relates to foreign law or of science or art, or as to identity of handwriting or finger impressions and the Court has to form an opinion upon that point, then the opinion of skilled/experienced persons in their respective areas may be taken into consideration. Expert evidence is covered under Ss.45-51 of the Evidence Act. S.45 of the Act allows that when the subject matter of enquiry related with science or art, as to require the course of previous habit or study and in regard to which inexperienced persons are unlikely to form correct judgment. It allows an expert to tender evidence on a particular fact in question and to show to the court that his findings are unbiased and scientific.

S.46⁵⁴ of the Act states that facts, not otherwise relevant, are relevant if they support or are inconsistent with the opinion of experts when such opinions are relevant.

S.47 of the Evidence Act exclusively deals with the opinion as to the handwriting. The explanation further elaborates the circumstances under which a person is said to have known the disputed handwriting.

The expert opinion is not confined to handwriting alone. The opinions in relation to customs are also admissible according to S. 48 of the Evidence Act.

The next question that arises is who can be called an Expert, what is the function of opinion given by expert in a matter before Court and further what is the character of opinion/advice adduced by an expert in forming opinion by the Court? Hon'ble Supreme Court in the case titled as Ramesh Chandra Agarwal v/s Regency Hospital Ltd. has broadly dealt and interpreted the scenario and held that, an expert is a person who devotes his time and study to a special branch of learning. However, he might have acquired such knowledge by practice, observation or careful study.

The expert is not acting as a judge or jury. It was further held that in order to bring the evidence of a witness, as that of an expert, it has to be shown that he has made a special study of the subject or acquired a special experience therein or in other words that he is skilled and has adequate knowledge of the subject.

The real function of the expert is to put before the Court all the materials, together with reasons which induce him to come to the conclusion, so that the

⁵⁴ Evidence Act

Court, although not an expert, may form its own judgment by its own observation of those materials. An expert is not a witness of fact (like other witnesses) and his evidence is really of an advisory character. The duty of the expert witness is to furnish the Judge with the necessary scientific criteria for testing the accuracy of the conclusions so as to enable the Judge to form his independent judgment by the application of these criteria. No expert can claim that he could be absolutely sure that his opinion was correct.

Hon'ble Supreme Court has further laid down in the case titled as State of Maharashtra v/s Damus/o Gopinath Shinde and others, AIR 2000 SC 1691⁵⁵, that:

“...mere assertion without mentioning the data or basis in support of his opinion is not evidence, even if it comes from an expert. It is held that such evidence though admissible, may be excluded from consideration as affording no assistance in arriving at the correct value without examining the expert as a witness in Court. Therefore, no reliance can be placed on an opinion alone...”

In the case titled as Kabul Singh v/s Gurinder Singh, opinion of the expert was sought regarding signatures put on a document. However, the expert also gave opinion that certain digits were changed which opinion was not sought for. The Hon'ble High Court of Punjab and Haryana held that such an opinion should be ignored and that expert should have confined himself to the relevant facts.

However, there is a probability to lean the opinion of private experts in favour of the party calling them. In such like cases, when there is a conflict of opinion

⁵⁵ State of Maharashtra v/s Damus/o Gopinath Shinde and others, AIR 2000 SC 1691

between the experts, then the Court is competent to form its own opinion with regard to signatures on a document or such like matters.

Another important issue under consideration is that whether the Courts are bound by the opinion given by an expert on a particular fact in a case. Hon'ble Supreme Court has answered this question in the case titled as Malay Kumar Ganguly v/s Dr. Sukumar Mukherjee, wherein it has been held that, a Court is not bound by the evidence of the experts which is to a large extent advisory in nature. The Courts have full powers to derive its own conclusion upon considering the opinion of the experts which may be adduced by both sides, cautiously, and upon taking into consideration the authorities on the point on which he deposes. The opinion could be admitted or denied. Whether such evidence could be admitted or how much weightage should be given thereto, lies within the domain and discretion of the Court.

The evidence of an expert should, however, be interpreted like any other evidence. Thus, it can be concluded that the expert opinion in numerous matters relating to identification of thumb impression, handwriting, footprints, fixing paternity, time of death, age of the parties, cause of death, possibility of the weapons used, disease, injury, sanity and insanity of the parties and other question of science or trade has become the need of hour and the person having required skill on that subject (called experts), are allowed to give their opinions in evidence as well as testify to facts/details leading to their opinion. The opinion of an expert having special skill in that particular field is relevant for the point of admissibility before the Court of law. There may be exceptions to

this rule, in spite of it when their direct evidence is lacking, then to corroborate the existing evidence, expert opinion is sought.

The lack of understanding and critical appraisal of specialists in general, by non-specialists, is all-pervasive. The field of Forensic Science is no exception. Neither the police, nor the lawyer, nor even the judge appreciates fully the advances or the extensive potentialities of the science. Forensics law however highlights some generally accepted principles of law that I will show below.

BURDEN OF PROOF AND STANDARD OF PROOF

In every litigation, there are occasions in the proceedings in which the question will arise as to which of the parties has the burden of proof on a given issue? Standing alone, the expression 'burden of proof' is self-explanatory. It is the obligation to prove. There are two principle kinds of burden of proof, which are legal burden and evidential burden. However, the evidential burden is regarded to be confusing and misleading when regarding it as a burden of proof.

Evidential Burden

The evidential burden is not strictly a burden of proof at all. It is best seen as a rule of common sense which says that, there must be some evidence for a particular issue to become a live one in order to be fit for the jury to consider it. It is sometimes said that an evidential burden is on a party to adduce some evidence to support a particular issue. This seems to be confusing and misleading, therefore, to call the evidential burden a burden of proof: it can be

discharged by the production of the evidence which has short of proof. The burden is discharged when there is sufficient evidence to justify, as a possibility, becomes favored by the tribunal of fact. For example, in criminal trial where the prosecution bears the evidential burden on a certain issue, it must adduce sufficient evidence so as to prevent the judge from withdrawing the issue from the jury. However, when the evidential burden is discharged, it does not necessarily mean it will succeed on the issue on question. The accused will not necessarily lose on that issue, even if he adduces no evidence in rebuttal, although if he takes that course, it is clearly risky.

Legal Burden

This burden is referred to as burden of proof or probative burden and as the ultimate burden. It is the obligation which is on a party in relation to a particular issue of fact in civil criminal case, and which must be discharged, or satisfied if the party is to win on the issue in question. Legal burden is to be distinguished from evidential burden as it is seen to be something completely different as given above. The issue as to whether a party has discharged this burden and proved a fact in issue is decided only once by the tribunal of fact at the end of the case when both parties have given all their evidence. The standard of proof required to discharge the legal burden depends on whether the proceedings are criminal (proof beyond reasonable doubt) or civil (balance of probabilities). Which part bears the legal burden of proof in relation to any given fact in issue is determined by the rules of substantive law as will be discussed below. Speaking generally, the determination of where the legal

burden falls is a matter of common sense. If certain facts are important to the claim of, for example, the claimant in civil proceedings, or the prosecution in criminal proceedings, that party must prove them. A useful statement under this is, “he who asserts must prove”. In examining in details on the incidence of the legal burden of proof, the criminal and civil cases are to be considered separately in this.

Criminal Cases

The legal burden of proving any fact in relation to the prosecution case relies upon the prosecution and remains with the prosecution throughout the trial. Both negative and positive allegations may be essential to the prosecution; therefore, he bears the legal burden of proving absence of the consent on a charge. Generally, then, the accused bears no legal burden in respect of the essential ingredients of the offence, whether them being positive or negative, or whether he denies any or all of them. In **Woolmington v DPP** the accused was charged with the murder of his wife, but he gave evidence that he shot her accidentally. The trial judge directed the jury that once it was proved that he had shot his wife, he bears a burden of disproving malice aforethought. However, the House of Lords held this to be misdirected and Lord Sankey LC said, in a now famous quote that,

“...Throughout the web of English criminal law one golden thread is always to be seen, that is the duty of the prosecution to prove the prisoner's guilt...”

This seems to be the basic rule for the burden of proof in criminal cases. However, the rule given by Lord Sankey is subject to three categories of exception to the general rule and the accused or defendant is then subject to the burden of proof. These exceptions are; where the accused raises the defence of insanity, where the statutory expressly places the legal burden on the defence, and where the statute impliedly places the legal burden on the defence.

Since Human Rights Act 1998 came into force, any provision is open to be incompatible with the provision under Article 6(2) (Everyone charged with a criminal offence shall be presumed innocent until proven guilty according to law) of the European Convention of Human Rights.

Insanity: When the accused raises insanity as a defence, he has the legal burden of proving it. When he is charged with murder and raises the issue of insanity or diminished responsibility, contrary to section 6 of The Criminal Procedure (Insanity) Act 1964 (here in after referred to as the 1964 Act), he is allowed to adduce evidence to prove. In the event, the prosecution bears the legal burden to prove the other issue on which they have adduced evidence. If the accused is regarded to be under a disability which renders him unfit to plead and stand trial, the issue may be raised under section 4 of the said 1964 Act by either the prosecution or the defence. If the issue is raised by the prosecution, they must prove it and satisfy the jury beyond reasonable doubt. If the issue is raised by the defence, they must prove it only on the balance of probabilities.

Expressly statutory exception: A number of statutes expressly place the legal burden of proving specific issues to the accused. The other issues other than

those specified, the legal burden to prove them remains to the prosecution. For example, section 2(2) of the Homicide Act 1957 puts upon the accused the legal burden of establishing the statutory defence of **diminished responsibility** on a charge of murder. This section does not contradict Article 6 of the European Convention of Human Rights.

Implied statutory exception: Section 101⁵⁶ of the Magistrates' Court Act 1980 provides that, where the defendant to an information or complaint relies for his defence on any exception, exemption, proviso, excuse or qualification, whether or not it accompanies the description of the offence or matter of complaint in the enactment creating the offence or on which the complaint is founded, the burden of proving the exception, exemption, proviso, excuse or qualification shall be on him; and this notwithstanding that the information or complaint contains an allegation negating the exception, exemption, proviso, excuse or qualification.

In *R v Edwards* this section is confined to summary trials and similar principles were applied to this case on indictment. In this case, Edwards was charged with indictment, with selling by retail intoxicating liquor without holding a justices' license which authorizes the sale contrary to s. 160 (1) of the Licensing Act 1964. The prosecution proved that he had sold intoxicating liquor but adduced no evidence showing that he did not have license. The provision under s.101 of the 1980 Act was set out a common law rule in a statutory form. It was used to construe the enactment under which the charge is laid in determining where the burden of proof lays. The same interpretation was also used in *R v Hunt* where

⁵⁶ Magistrates' Court Act 1980

the prosecution proved that the defendant was in possession of powder containing morphine contrary to s 5 of the Misuse of Drugs Act 1971, but their evidence did not prove whether or not this powder was of a type covered by a provision in the relevant legislation which exempted preparations containing not more than 0.2% of morphine. The trial was rejected. The Court of Appeal dismissed the appeal on the fact that the effect of the Act was to place the burden of proving that the powder fell within the exceptions of the defendant, and he had failed to discharge it. The House of Lords allowed the appeal on the ground that the rule about exceptions contained in s 101 of the Magistrates' Court Act 1980 did not apply, and that the burden was on the accused to show that the facts fell within the exception. The reasoning was that, when Lord Sankey in *Woolmington v DPP*, used the phrase “**any statutory exception**”, he was not referring only to statutory exceptions which are expressly placed on the accused. A statute can place the legal burden of proof on the accused either expressly or impliedly. And second, when the statute places that legal burden on the accused impliedly, that burden is on the accused whether the case is a summary trial or indictment contrary to s 101 of the 1980 Act.

Implied statutory exceptions under s 101 of the 1980 Act are capable of deviating from Article 6 of the European Convention of Human Rights, and the cases by virtue of s 101 or the common law principles which have been construed to impose a legal burden on the accused must be read subject to the Human Rights Act 1998, and the cases in which the burden of proof shifts have been challenged on the basis of incompatibility with Article 6.

Reverse Onus Provision and the Human Rights Act 1998:

Reverse onus clause is a provision in a statute that shifts the burden of proof mainly to the said party. Since the coming into force of the Human Rights Act 1998, any reverse onus is open to challenge on the basis of its incompatibility with Article 6(2) of the European Convention of Human Rights, which ‘Everyone charged with a criminal offence is presumed innocent until proven guilty. Clearly, a reverse onus will not give rise to a finding of incompatibility, but if it unjustifiably goes against Article 6(2), the further issue will arise as to whether it should be read down in accordance with s 3 of the 1998 Act in order to impose an evidential and not a legal burden on the accused. The presumption of innocence in both domestic law and convention is that, it is opposite to the notions of fairness for the prosecutor to accuse the accused for a crime, and for the accused then to be required to disprove the accusation so as to avoid punishment and conviction. Under domestic law, the Parliament does not regard presumption an absolute right. The same, Article 6(2)⁵⁷ right is not absolute. To reach the question of incompatibility, the test is whether the limitation of Article 6(2) right is lawful or satisfies the principle of proportionality. (There should be a balance between the interests of the community and the protection of the individual rights). In *R v Lambert*, the defendant was found in possession of a bag containing two kilograms of cocaine, and was charged and convicted of possessing cocaine with the

⁵⁷ Constitution of the republic of Uganda 1995 as ammended

intention of supply contrary to s 5(3)⁵⁸. The defendant relied upon s 28 of the 1971 Act, saying that he did not believe or suspect or have reason to suspect that the bag contained cocaine or any controlled drug. The judge directed the jury that in order to establish the possession of a controlled drug, the prosecution has to prove that the defendant had the bag in his possession and it contained the controlled drug, and then thereafter the burden should be on the accused to bring himself within s 28 of the said Act and prove on balance of probabilities that he was not aware.

The House of Lord held, that since the trial took place before the 1998 Act came into force, the accused was not entitled to rely on the stated breach of his rights under the European Convention. However, the House of Lords was in view that s 28 is not compatible with Article 6(2), and under s 3 of the 1998 Act, may be regarded as imposing an evidential burden on the accused. The question of compatibility was approached by three stage tests; whether there has been a legislative interference with the presumption in Article 6(2); if so, whether there is an objective justification for such interference; and, if so whether the interference is proportionate.

Contrary to the first stage, it was held that taking into account s 28, an accused will be denying moral blames and the maximum penalty for the offence which is life imprisonment, therefore s 28 derogates from the presumption of innocence. A defence may be closely linked with mens rea and moral blameworthiness that it will derogate from the presumption of innocence to place the burden of proving that defence on the accused. As to the second

⁵⁸ Misuse of Drugs Act 1971

stage, it was satisfied that there is an objective justification for the legislative interference with the presumption of innocence, where drug dealers typically secrete drugs in some container, enabling the person in possession of the container to say that he was not aware of the contents. Such a defence is common and gives difficulties for the police and prosecuting authorities. As to the third stage, it was held that the burden is on the state to show that the legislative means adopted were necessary. The issue of proportionality required them to consider whether there was a necessity to impose a legal rather than an evidential burden. The prosecution must establish that the accused possessed the controlled drugs, and under s 28, the accused must prove on a balance of probabilities that he did not know the package contained controlled drugs, otherwise convicted. Conclusively, s 28 was regarded to be incompatible with Article 6(2). However under s 3⁵⁹ where s 28(2) and (3) required the accused to prove the matters specified, it may mean, give sufficient evidence, thus placing an evidential burden on the accused.

The imposition of a legal burden on the accused seems to be likely accepted in the case of offences in many authorities who are concerned with regulating the conduct of a particular conduct for the interests of the public and for the matters that are not regarded truly criminal. However, to some this principle remains opposed especially on the imprisonable offences where the issue of conviction by the jurors or magistrates is left in doubt as to whether the accused has established his defence, or his version of events are likely to be true or not. In some cases, as we have seen, the reverse onus provision (shift of burden of

⁵⁹ Human Rights Act 1998

proof) is regarded to be incompatible with Article 6 and seems to impose an evidential burden. However, Parliament has decided not to legislate all burdens on the accused to be evidential only.

Civil Cases

The general principle in civil cases is that, he who asserts must prove. Certain matters are important to a party in civil proceedings in the sense that they must be proved by him if he is to succeed. The legal burden of proof will be on the part that asserts the claim. For example, on the issue of negligence, the claimant bears the legal burden to prove the duty of care, breach of that duty of care and the loss suffered as a result. The legal burden of proving a defence which is in denial of the claims given by the claimant, such as *volenti non fit injuria* or contributory negligence lies on the defendant. In *BHP Billiton Petroleum Ltd v Dalmine SpA* it was held that, although in most civil cases the statements of case are likely to be a good guide to the issue of legal burden of proof, they cannot be definitive, because the party cannot take upon himself a burden which is not imposed to him. A person cannot escape a legal burden given to him over a certain issue important to his case by drafting his defence or claim in relation to the issue by way of negative allegation. In both civil and criminal cases, the legal burden may be determined by statute. For example, where a former employee is claiming unfair dismissal, to prove that he was dismissed, it is for the employer to show the reasons for the dismissal and that

they constitute grounds laid down in the statute in order for the dismissal to be fair. Failure to do so, then the dismissal will be regarded unfair.

Let us have a review of the principle of proof beyond reasonable doubt in the case **Uganda v Dr Aggrey Kiyingi And 2 Others (Criminal Session Case No. 0030 Of 2006)**

Case No: (Criminal Session Case No. 0030 Of 2006). Media Neutral Citation: [2006] UGHC 52

Judgment Date: 10 December 2006

Dr Aggrey Kiyingi (A1), Charles Berwanaho (A2), No. 22682 D/C Mugisha Bob (A3) and others not before Court were indicted for murder contrary to sections 188 and 189 of the Penal Code Act of the Republic of Uganda. The particulars of the offence alleged that the accused persons above named on or about 11th day of July 2005 at Buziga, Makindye Division in the Kampala District, murdered one Robinah Erina Kayaga Kiyingi.

The prosecution theory was that the deceased was a prominent lawyer in town and wife to Dr Kiyingi. The two were elite students at Gayaza and Budo before they met at Makerere University as students. They later wedded in 1977 and had several children; two of whom were successful lawyer and doctor, like mother and father. Charles Berwanaho, (A2), was a close friend of Dr Kiyingi and also his employee at Dehezi International Ltd. Bob Mugisha (A3) was a Police Officer closely associated with Dr Kiyingi and used to provide him with escort and personal bodyguard services at the instructions of Government.

During the dictatorial and fascist regime of Idi Amin, the couple relocated to Kenya and around 1981 relocated to Australia where Dr Kiyingi is still based

where he is a heart specialist after undergoing a number of specialized trainings in various International Institutions of world repute. During their stay in Australia, Dr Kiyingi and the deceased acquired a lot of property both in Australia and Uganda and later formed a powerful company called Dehezi international Ltd in Kampala where the deceased was a director.

However, over time Dr Kiyingi and the deceased developed a protracted irreconcilable misunderstandings and differences in both their marriage and company affairs which tore their relationship asunder. Their marriage became characterized by fault findings quarrels, fights, neglect, abuses and eventual desertion, meted out on the deceased by her husband, Dr Kiyingi. Consequently, the deceased left Australia and pulled out of Dehezi international Ltd, to form her own private legal practice in Kampala and to engage in other work and social activities independent of Dr Kiyingi. The deceased however continued living in the family residence at Buziga while Dr Kiyingi, who virtually deserted her, remained in Australia with the children most of the time. All efforts by family members and leading personalities to reconcile the marriage ended in vain. The couple remained on bad terms until the death of the deceased.

At one point, Dr Kiyingi started plotting for the death of the deceased and expressed this plot overtly by talking to various people to help him kill the deceased. Some of the people and plans he had sought to involve became known to the deceased. The deceased reported one such incident to police and her relatives whereupon she expressed fear that Dr Kiyingi, was after her life.

In 2003 Dr Kiyingi filed divorce proceedings in Uganda against the deceased. The deceased in a matter of surprise to the petitioner, responded by seeking to challenge the jurisdiction of Courts in Uganda in the matter and filed a similar proceeding in the Australia Court, where she thought and believed her property interests and other interests would better be catered for because of the property the family had in Australia and by the fact that the petitioner had a dual citizenship in Australia and Uganda.

The deceased's above move was alleged to have greatly angered Dr Kiyingi, who allegedly threatened that the deceased would lose everything. By the time of the death of the deceased the two cases were still pending in both Uganda and Australia.

In addition to the above state of affairs within the family, at the time of the incident, the husband was living in Australia with other women and had cut off all dealings with and any form of help to, the deceased. Whenever he would come to Uganda, he would stay elsewhere. He had stopped paying utility bills and had recently caused electricity and water to be disconnected from the family home at Buziga where the deceased lived with only one house girl and shamba boy. Immediately before the incident Dr Kiyingi sneaked to Uganda and went secretly to Buziga home and removed some property, which included a television set and music system.

The final plot to kill the deceased involved the accused persons and others not before court. The accused persons had a lot of communication and contact among themselves and with others. Charles Berwanaho was the Chief coordinator. He was the one who brought private Atwine, who was his brother.

Atwine died on remand. Bob Mugisha provided the killer gun through Charles Berwanaho. Bob Mugisha was overheard by some people talking about arrangements by his friend who was outside the country to have his wife killed. Soon after the incident, Bob Mugisha was heard saying that he knew the killers. In short, on the fateful night of 11th July 2005 at around 9.00pm, the deceased was returning home alone, when she was shot in cold blood in her car at the gate and died instantly. Her assailants had been waiting for her arrival, trigger happy. Soon after the incident Dr Kiyingi called from Australia to find out what was going on before issuing instructions for burial arrangements.

Investigations led to the recovery of a gun and other items close to the scene of crime. Further investigations led to the arrest of all the accused persons, hence this indictment.

When the three accused persons were arraigned, they pleaded not guilty. Having pleaded not guilty our law as posited in the constitution requires that the charge against the accused ought to be proved beyond all reasonable doubt. See: *Woolmington -Vs.- DPP [1935] AC 462*; *Sekitoleko Vs.- Uganda [1967] EA 531*.

Generally speaking, proof beyond reasonable doubt means that:

- 1) Before verdict, the court should consider the evidence as a whole to determine the guilt.
- 2) The court should not examine facts in issue separately and in isolation; and
- 3) That where issues of credibility arise between evidence of prosecution and the defence, it is not necessary to believe the defence evidence on a vital issue,

it is sufficient if in the context of all the evidence, a state of reasonable doubt is left as to this guilt of the accused.

If there is a reasonable doubt created by the evidence given by either the prosecution or the accused person, the only conclusion which ought to be drawn is that the prosecution has not made out the case and the accused is entitled to acquittal. It is however instructive to observe that beyond reasonable doubt does not mean proof beyond shadow of doubt or absolute certainty. A clear distinction was made out by LORD DENNING IN MILLER VS MINISTER OF PENSIONS [1947] 2 ALLER 372, 373.

“That degree is well settled. It need not reach certainty, but it must carry a high degree of probability. Proof beyond doubt does not mean proof beyond the shadow of a doubt. The law would fail to protect the community if it admitted fanciful possibilities to deflect the course of justice. If the evidence is so strong against a man as to leave only a remote possibility in his favour which can be dismissed with a sentence, “of course it is possible but not in the least probable”, the case is proved beyond reasonable doubt but nothing short of that will suffice”

In a murder charge the prosecution has to prove the following ingredients beyond all reasonable doubt:-

- 1) that the deceased is dead;
- 2) that the death of the deceased was caused unlawfully;
- 3) that the death was caused with malice aforethought; and
- 4) that the accused participated I causing the death of the deceased.

To prove the above ingredients, the prosecution relied on the evidence of 26 prosecution witnesses. I Shall review the forensic evidence later in this book

Conclusively, the general rule in both civil and criminal cases, still remains, that, it is for the prosecution to have the burden of proving, however there are circumstances or rather exceptions where the burden of proving is regarded to shift to the accused as discussed above in this assignment.

P R E S U M P T I O N O F I N N O C E N C E

It is a fundamental principle of English law that a person is innocent of any criminal offence until proven guilty. The burden of proving the defendant's guilt falls upon the prosecution who must prove to the satisfaction of the jury (or magistrates) that the accused is guilty beyond reasonable doubt (this is referred to as the standard of proof). It is not for the accused person to prove his or her innocence and the accused is entitled to the benefit of any doubt as to his or her guilt. As Lord Sankey LC stated in the leading case of *Woolmington v DPP*⁶⁰:

“...No matter what the charge or where the trial, the principle that the prosecution must prove the guilt of the prisoner is part of the common law of England and no attempt to whittle it down can be entertained [p 482]..”

Ashworth and Blake have argued that ‘from time to time English judges have articulated fundamental principles which they believe to underlie criminal law and procedure’ ([1996] Crim LR 306). These include the privilege against self-incrimination, the need for the prosecution to prove a guilty mind and, of

⁶⁰ *Woolmington v DPP* [1935] AC 462

course, the ‘golden thread’ acknowledged by Viscount Sankey that the prosecution must prove the prisoner’s guilt. However, it should be noted that, in a parliamentary democracy, any of these fundamental rights can be withdrawn, and Ashworth and Blake consider that: ‘Developments in recent years have cast grave doubt on the existence of these “fundamental principles”.’ However, if the defendant raises a defence to the charge, for example, provocation, duress or self-defence, the law usually places an evidential burden on him to provide some credible evidence to substantiate the claim. At this point, the prosecution is then required to prove ‘beyond reasonable doubt’ that the defendant is not in fact entitled to the benefit of the defence. In a small number of exceptional cases (chiefly, insanity and diminished responsibility—see Chapters 10 and 6 respectively) the law places the burden of proof squarely on the shoulders of the defendant to prove that he or she was suffering from this affliction but the standard of proof here is that used in the civil courts, ‘on a balance of probabilities’⁶¹

The Golden Thread rule in *DPP v Woolmington* [1935 HoL] concerned a jury direction by the judge shifting the onus to the defendant to prove he was not guilty of intentional murder after the prosecution had established his case. If the defendant had to prove his innocence on the balance of probabilities, the judge may be bound to convict despite reasonable doubt as to the basic elements of the offence. In the case *R v Fung Mui Lee* [1996 CA]⁶² The trial judge had directed the jury that there is a presumption that a person intends the natural and probable consequences of his acts. HELD: That direction was contrary to

⁶¹ (*Carr-Briant* [1943] KB 607)

⁶² *R v Fung Mui Lee* [1996 CA]

the presumption of innocence, and contrary to s65A(1) of the CPO. And contrary to Woolmington since it was held that it is for the prosecution to prove every element of an offence.

Tse Mui Chun v HKSAR [2004 CFA]⁶³ HELD: that the prosecution has the onus to prove every element of the offence. The making of ‘infringing copies’ was an express and therefore essential ingredient in the offence. The absence of the requisite copyright consent is not an “exemption from the operation of the law creating the offence” it is an ingredient of the offence itself. It was not just up to the defendant to show a license or permission.

Generally speaking, in criminal law the burden of proof lies on the prosecution and the prosecutor in this case holds the burden of proving the guilt of an accused beyond reasonable doubt, and if there are left any doubts in the mind of the judge, jury or magistrate then the court will have no other option but to acquit the offender. The fact that the prosecution holds the burden of proving the guilt of a person is further brought about by the fact underlined in the constitution of this country. It should be noted that Article 28 subsection 3, part (a) of the constitution of Uganda 3 states that:

“Every person who is charged with a criminal offence be presumed to be innocent until proved guilty or until that person has pleaded guilty”.

Again this under scores the fact that the prosecution holds the onus of providing the guilt of an offender beyond reasonable doubt. a good, case to elaborate this issue is the one of Woolmington vs. D . p . p ⁶⁴

⁶³ Tse Mui Chun v HKSAR [2004 CFA]

⁶⁴ Roger Bird, Osborn’s Concise Law Dictionary 2 H.H.Denis; Law of evidence 3 Article 28, subsection 3 part (a) constitution of Uganda 1995 4 [1935] AC, Pg 462. <http://www.clicktoconvert.com>

Woolmington was charged for murdering his wife by shooting, he admitted that she was killed by a bullet fired from a rifle which he was handling, but said that he squeezed the trigger, involuntarily, while endeavouring to induce her to return to live with him by threatening to shoot himself, Woolmington was convicted. An appeal to the court of appeal was dismissed but a further appeal to the House of Lords, succeeded, and Woolmington's conviction was quashed. In the House of Lords, LORD SANKEY said:

“ throughout the wave of the English criminal law, one golden thread is always to be seen that is the duty of the prosecution to prove the person's guilt..... the principle that the prosecution must prove the guilt of the person is part of the criminal law of England and no attempt to whittle it down can be entertained...”

Therefore the rule that the prosecution must prove the accused guilty, beyond reasonable doubt means that in principle the prosecution must prove to nothing any defense raised by the accused. This clearly underscores the fact that the burden of proving the guilt of an accused, heavily lies on the prosecution. It is they who have to show to court that such an accused cannot be left to go unpunished for his /her crime because he /she bears the utmost criminal responsibility and must show the evidence thereof;

To further drive the point home, I yet have another case to discuss, this issue, it's the one of **OKEITH OKALE and others Vs. REPUBLIC**⁶⁵. In this case,

⁶⁵[1965] E.A Pg. 555 <http://www.clicktoconvert.com>

4 appellants were convicted of murder, and the issue before court was identification and the prosecution case consisted of evidence from the widow of the deceased, and that of dying declaration.... In this case the Judge held a prosecution case, and then cast on the appellants the burden of disproving it or raising doubts about it. It was held, the burden of proof in criminal proceedings is throughout on the prosecution, and its duty of the trial Judge to look at the evidence as a whole, so the appeal was allowed conviction squashed and death sentences set aside. The point to note here is that the right decision should be that the burden of proof should lie on the prosecution and not on the accused. It's the prosecution who have the burden of proving the guilt beyond reasonable doubt. Further still we yet still have another case supporting the fact that the burden of proof shifts on the prosecution, it's the case of **SEKITOLEKO Vs. UGANDA**⁶⁶. In this case the appellant was charged with robbery contrary to section 272 and punishable under section 273 of the penal code. His defence was Alibi.

Alibi according to dictionary of Law, "This is evidence tending to show that by reason of the presence of the accused at a particular or in a particular area at a particular time he was not or was unlikely to have been at the place where the offence is alleged to have committed at the time of the alleged commission". In the course of his Judgement the learned magistrate said that the burden of proving Alibi lay on the appellant, he was convicted and sentenced to 3 years

⁶⁶ 6 (1967) EAR 531 7 Section 272 and 273 of the penal code of Uganda, Laws of Uganda. Cap. 106 8 Dictionary of Law 6th Edition Pg. 18 <http://www.clicktoconvert.com>

imprisonment, he appealed and it was held that as general rule of law the burden on the prosecution of proving the guilt of a person beyond reasonable doubt never shifts whether the defence set up an Alibi or something else. It was further held that the burden of proving and Alibi doesn't lie on the prisoner and the trial magistrate had misdirected himself. So the appeal was allowed and conviction and sentence squashed. This again casts a very fine picture of the fact in Alibi cases; the burden of proof falls on the prosecution.

Whereas it's a rule that the prosecution must prove the accused guilty, beyond reasonable doubt, this has been watered down by the fact that in many offences, the accused has the burden of proving something, although his defence when he holds the burden is lighter than that borne by the prosecution in proving guilt, for he as the accused only proves the facts on the balance of probabilities and not beyond reasonable doubt. An accused to begin with, according to Roger Bird⁹, is one charged with an offence, and here discussed below are some of the instances when the burden of proof shifts to the accused. The Burden of proof will shift to the accused when a person pleads a defence of insanity. The correct definition of the term insanity is based upon the rules based in M'NAUGHTON's case, the case provides that a defendant must establish that one is suffering a defeat of wisdom arising from a disease of mind, resulting in the defendant being unaware of the nature and quantity of his act. The leading statement was brought forth in the M'NAUGHTON's case that everyone is proved sane until the contrary is proved to be the satisfaction of the Jury or the court. This M'NAUGHTON's rule is incorporated in section 1111 and section 1212 of the penal code;

“Every person is presumed to be of sound mind, and to have been of sound mind at any time which comes in question until the contrary is proved.”

MENS REA

We saw in the previous Chapters that the prosecution must prove that the defendant brought about the prohibited act (or in some cases an omission or state of affairs). The prosecution’s next task is to prove that the defendant did this with the state of mind prescribed by the definition of the crime. This is usually referred to as the mens rea, but is sometimes also described as the ‘fault element’ or ‘mental element’. However, some caution is necessary here because ‘fault’ may be defined more broadly than mens rea or ‘mental element’. So, there is no doubt that negligence is ‘fault’ but, traditionally, it is not included within the definition of mens rea. At common law, mens rea usually means intention or recklessness. If the prosecution merely has to prove negligence to establish the further element for liability, then the offence is one which requires proof of fault but not of mens rea. Yet, such distinctions cannot be made with absolute conviction, since the courts have recognised a concept of ‘objective’ recklessness which very closely resembles negligence. As Nicola Lacey observed in her article, ‘*A clear concept of intention: elusive or illusory?*’ (1993) 56 MLR 621: Mens rea is the (not entirely happy) umbrella term used by most criminal law scholars to refer to a range of practical attitudes or states of mind on the defendant’s part, which form part of the definition of many offences’. There is a large number of offences in which the prosecution



does not have to prove any fault element at all, neither mens rea nor even negligence. These are known as offences of strict liability hence focus on:

- intention;
- recklessness;
- offences of strict liability.

The Mental Element—mens rea

The prosecution must prove that the defendant brought about the actus reus with the state of mind prescribed by the definition of the particular crime. This state of mind is usually referred to as the mens rea.

Direct and Oblique Intention

Some crimes require proof that the defendant acted intentionally. Intention is not the same thing as motive. Where the prohibited consequence is wanted for its own sake this is referred to as direct intention. Where the defendant does not have an aim or purpose to cause a prohibited result but knows that his conduct is certain or almost certain to cause it, this is said to be oblique intention. This is true whether or not the defendant has some other aim or purpose in engaging in the conduct. Parliament has failed to define intention and the courts have experienced considerable difficulties in attempting to define the term. The jury is not entitled to find an intention to kill or cause grievous bodily harm unless satisfied that the defendant appreciated that this result was virtually certain.

Recklessness

Defining recklessness has also proved problematic for the courts during recent years. Originally, it meant that the defendant undertook a deliberate and conscious unreasonable risk but in two landmark cases in 1981 the House of Lords added to this subjective test an objective element. These decisions are viewed by many legal scholars as flawed and wrong in principle because they lead not only to injustice in some cases but also because they have created serious uncertainty in the criminal law. Despite a ruling by the House in 1983 that the new definition applied throughout the law, subsequent decisions have shown that the new objective element does not apply to particular offences. Indeed, currently the objective element now only applies, for most practical purposes, to offences under the CDA 1971.

Transferred Malice

The doctrine of transferred malice is that the malice a defendant bears towards his intended victim may, in certain circumstances, be transferred to the actual victim. For example, if A intends to shoot B but misses and kills C, A's malice may be transferred from B to C and A can be convicted of murder. It cannot be transferred, however, if there is no compatibility between the harm intended (or foreseen) and the harm actually inflicted.

Coincidence of Actus reus and Mens rea

The actus reus and mens rea must normally coincide in point of time. However, in some cases the courts have held the actus reus to be a continuing act and

liability can be established if the defendant can be proven to have possessed mens rea at any point during the continuance of the act. Other cases have established that it is enough if the mens rea and actus reus can be said to have existed during a sequence of events.

Strict Liability Offences

Many crimes do not require the prosecution to prove that the defendant acted either intentionally or recklessly or even negligently with respect to at least one element of the actus reus. These offences are usually, although not always, of a minor regulatory nature and are referred to as crimes of strict liability. Whether a particular crime will be found by the courts to require mens rea or to be a strict liability offence depends upon a variety of factors. The case law is inconsistent on this important point despite numerous attempts to clarify the matter. Whilst there are arguments both for and against strict liability legal scholars are, in general, hostile. Many would prefer an approach based upon negligence. The Law Commission favours a minimum liability threshold of (subjective) recklessness unless parliament provides to the contrary. I shall review the following case in its entirety to effect mens rea and its attribute

Uganda v Dr Aggrey Kiyingi And 2 Others (Criminal Session Case No. 0030 Of 2006)

The Case No: (Criminal Session Case No. 0030 Of 2006) Media Neutral
Citation: [2006] UGHC 52

Judgment Date: 10 December 2006 BEFORE: - HON. MR JUSTICE RUBBY
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Dr Aggrey Kiyingi (A1), Charles Berwanaho (A2), No. 22682 D/C Mugisha Bob (A3) and others not before Court were indicted for murder contrary to sections 188 and 189 of the Penal Code Act of the Republic of Uganda. The particulars of the offence alleged that the accused persons above named on or about 11th day of July 2005 at Buziga, Makindye Division in the Kampala District, murdered one Robinah Erina Kayaga Kiyingi.

The prosecution theory was that the deceased was a prominent lawyer in town and wife to Dr Kiyingi. The two were elite students at Gayaza and Budo before they met at Makerere University as students. They later wedded in 1977 and had several children; two of whom were successful lawyer and doctor, like mother and father. Charles Berwanaho, (A2), was a close friend of Dr Kiyingi and also his employee at Dehezi International Ltd. Bob Mugisha (A3) was a Police Officer closely associated with Dr Kiyingi and used to provide him with escort and personal bodyguard services at the instructions of Government.

During the dictatorial and fascist regime of Idi Amin, the couple relocated to Kenya and around 1981 relocated to Australia where Dr Kiyingi is still based where he is a heart specialist after undergoing a number of specialized trainings in various International Institutions of world repute. During their stay in Australia, Dr Kiyingi and the deceased acquired a lot of property both in Australia and Uganda and later formed a powerful company called Dehezi international Ltd in Kampala where the deceased was a director.

However, over time Dr Kiyingi and the deceased developed a protracted irreconcilable misunderstandings and differences in both their marriage and company affairs which tore their relationship asunder. Their marriage became characterized by fault findings quarrels, fights, neglect, abuses and eventual desertion, meted out on the deceased by her husband, Dr Kiyingi. Consequently, the deceased left Australia and pulled out of Dehezi international Ltd, to form her own private legal practice in Kampala and to engage in other work and social activities independent of Dr Kiyingi. The deceased however continued living in the family residence at Buziga while Dr Kiyingi, who virtually deserted her, remained in Australia with the children most of the time. All efforts by family members and leading personalities to reconcile the marriage ended in vain. The couple remained on bad terms until the death of the deceased.

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citizenship in Australia and Uganda.

The deceased's above move was alleged to have greatly angered Dr Kiyingi, who allegedly threatened that the deceased would lose everything. By the time of the death of the deceased the two cases were still pending in both Uganda and Australia.

In addition to the above state of affairs within the family, at the time of the incident, the husband was living in Australia with other women and had cut off all dealings with and any form of help to, the deceased. Whenever he would come to Uganda, he would stay elsewhere. He had stopped paying utility bills and had recently caused electricity and water to be disconnected from the family home at Buziga where the deceased lived with only one house girl and shamba boy. Immediately before the incident Dr Kiyingi sneaked to Uganda and went secretly to Buziga home and removed some property, which included a television set and music system.

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In short, on the fateful night of 11th July 2005 at around 9.00pm, the deceased was returning home alone, when she was shot in cold blood in her car at the gate and died instantly. Her assailants had been waiting for her arrival, trigger happy. Soon after the incident Dr Kiyingi called from Australia to find out what was going on before issuing instructions for burial arrangements.

Investigations led to the recovery of a gun and other items close to the scene of crime. Further investigations led to the arrest of all the accused persons. Hence this indictment.

When the three accused persons were arraigned, they pleaded not guilty. Having pleaded not guilty our law as posited in the constitution requires that the charge against the accused ought to be proved beyond all reasonable doubt. See: Woolmington -Vs.- DPP [1935] AC 462; Sekitoleko Vs.-Uganda [1967] EA 531.

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- 2) That the death of the deceased was caused unlawfully;
- 3) That the death was caused with malice aforethought; and
- 4) That the accused participated in causing the death of the deceased.

To prove the above ingredients, the prosecution relied on the evidence of 26 prosecution witnesses. The evidence of the prosecution witnesses can be summarized as follows:

The deceased, Robinah Erina Kayaga Kiyingi was the wife of Dr Aggrey Kiyingi (A1). The two met while they were in High Schools in Gayaza High School and King’s College Budo respectively. They later on met at Makerere

University where they cemented their relationship and eventually married and wedded in 1977. The said marriage had several children two of whom took to their parents' professions thereby becoming a lawyer and doctor respectively, after sometime the marriage fell on the rock with irreconcilable misunderstandings and differences. Consequently, the deceased was forced to leave Australia where they had relocated, to set up her private legal practice in Kampala. The deceased was occupying the family residence at Buziga according to the evidence of Dr Kasirye Alemu (PW2). While Dr Kiyingi (A1) who had virtually deserted her, remained in Australia with most of the children. According to Alemu (PW2), the deceased and the Dr Kiyingi remained on bad terms until the time of her death. According to PW2, PW11 and PW12 life in the family was characterized by witch hunting, quarrels, fights, threats, abuses, neglect and eventual desertion.

At one point Dr Kiyingi plotted through his uncle, one Laban Kiwanuka to kill the deceased and the matter is still pending in Buganda Road Court. Another plot was when he requested his housemaid Nabossa Prossy (PW13) to help in killing the deceased, a request she turned down on the strength that she was a born again Christian. That was in 2003.

After the death of the deceased, the police put an advert requesting for information leading to arrest of the killers. Subsequently one Nasuna Sadha (PW4) gave information that she had been in contact with one private Atwine who had narrated to her how the death of the deceased was planned by Dr Kiyingi (A1), coordinated by Charles Berwanaho (A2) and executed by himself (Atwine) with the help of one Bernard using a gun provided by bob Mugisha

(A3). From that information the police arrested the late Atwine from the home of one Nicholas Musiime (PW1). Nicholas Musiime also confirmed that the late Atwine used to stay with him and that Atwine was on a mission of killing the deceased. After tallying the information, police arrested the three accused persons. Nasuna Sadha (PW4) testified that the late Atwine talked to Dr Kiyingi on her phone.

Dr Andrew Simbwa Kibuka Kiyingi (PW10) and Samali Recho Biyinzika Nakagulire Kiyingi (PW12) who were both children of the couple testified that soon after receipt of information about the death of the deceased they knew it was their father Dr Kiyingi who had had a hand in it because of his past threats and also because during that trying time their father never consoled and comforted them and neither showed any sense of mourning even during the funeral services. He was cold, reserved and never talked about the deceased during his speech. The evidence of police officer D/Sgt. Turyasingura David (PW5) was to the effect that when he saw police advert, requesting for information about the death of the deceased and made comments that it was bad for Dr Kiyingi to kill his wife, Bob Mugisha (A3) told him that he knew the killers of the deceased. When he pressed him (A3) to divulge more light, he declined saying that the family of Dr Kiyingi were very rich and would kill him if they knew about his revelation. D/Constable Ahimbisibwe also testified that sometimes in May 2005 Bob Mugisha (A3) received a call and later on told them that there was a friend of his living abroad who had a girlfriend in Uganda who had conned him and wanted him to help in killing her and that the mission was to cost shs.50 million. He further testified that on 12th July 2005 when he

was at old Kampala police station two men came looking for Bob Mugisha (A3). When A3 was arrested, he was surprised to see on 23-7-2005 the photograph of one of the two men he had seen looking for him at old Kampala as one of the suspects in the killing of Robinah Kiyingi.

After the death of the deceased Dr William Male Mutumba (PW7) performed post mortem examination on the body where he established that the deceased died of multiple gunshot injuries that resulted in severe laceration of the brain, lungs and heart. He observed that the three organs were interdependent such that if one of them was affected or ceased to function, the functions of the other two would also lapse.

Four key police officers who investigated the case testified before Court: D/Sgt Karugaba (PW8), D/SP Aisu Victor (PW15), D/IP Katungi, (PW21) and D/C Sakwa (PW23).

D/Sgt Karugaba and D/IP Katungi were the two officers who were at the centre of the investigations. They went to the scene and recovered some exhibits, some of which were submitted for forensic examinations. Their evidence was that the death of the deceased had been planned by Dr Kiyingi coordinated by Berwanaho (A2) and executed by the late Atwine who was a brother of Berwanaho (A2). The gun which was used was brought by Bob Mugisha (A3). That gun was recovered near the scene. Its butt had been cut off and its serial number removed. The gun and ammunitions recovered at the scene were taken to Nairobi by D/SP Aisu (PW15), for forensic examinations. Mr Johnston Musoki Mwangela (PW9), firearms expert from CID headquarters Nairobi, with great skills, managed to restore the serial number, which the assailants had

erased. He also confirmed that the cartridges which were recovered from the scene had been fired from the said gun.

D/C Sakwa Fred (PW23) was tasked to procure print out from MTN, Celtel and mango service providers to trace communication between A1, A2, A3 and the late Atwine prior and after the murder of the deceased. His evidence showed that apart from having original or permanent phones, all the four accused persons acquired other private numbers which they began using on specific dates and stopped using on some other dates during the execution of the mission to kill the deceased.

Lastly officers from the three service providers i.e. MTN, Celtel and Mango, gave evidence to confirm that they provided print outs to help police investigations. They were Mugisha Collins (PW24) from MTN Ingin Nyakabwa (PW25) from UTL and Nsubuga Patrick (PW26) from Celtel.

Dr Aggrey Kiyingi (A1) made unsworn defence where have relied on total denial and alibi. He told court that though their marital problems had become serious and irredeemable, he still loved and respected the deceased and opted for the most civilized least confrontational separation which was legal divorce. Before that he thought he was the problem in the marriage for not giving the deceased the necessary attention. So, he offered her a second honeymoon and took the deceased to the most expensive and luxurious cruises money could buy in the Mediterranean Sea in the year 2000. After trying family arbitration and counseling in vain he resorted to divorce. But even after divorce petition, he continued to love and respect the deceased who was staying in the matrimonial home in Buziga with ease and all the necessary services like

power water and workers. He told court that he received the sad news at 6.45am Australian time from his brother in law in London (Mr Semanda) on 12th July 2005, which the deceased had been shot dead. He was shocked, confused and disoriented. After a while he recollected himself and contacted his two sons Kibuka and Kirabo and later his daughter, Samali and started making final arrangements to fly to Uganda. Later he contacted relatives and friends in Uganda asking them to make burial arrangements. He however denied calling Bomboka (PW3) and Dr Eva Kasirye (PW2). He denied calling or receiving a call from Berwanaho (A2). He also denied calling the late Atwine. He told court that he left Australia on 13/7/2005 at 1.00p.m. and arrived in Entebbe on Thursday 14th July 2005 at 8.30am and proceeded to Buziga Home. After greeting the numerous mourners, he was shocked to see the cold reception from his in-laws many of whom did not want to speak to him except his father in law who consoled him in the usual Kiganda fashion “Kitalo nyo”.

After that he summoned the children in the master bedroom, including the two girls, Samali and Sanyu whom he found already at Buziga and consoled them and prayed together. He told court that he was degraded and humiliated during the burial, first by Hon Tim Lwanga who bluntly prevented him from consoling and hugging his children by shielding and pushing them away from him and secondly by his arrest by Sgt Karugaba, which prevented him from mourning the deceased. Earlier on the same Lwanga together with Dr Eva Kasirye (PW2) and Samali (PW2) had requested the clergy at Namirembe to block him from addressing the congregation at the memorial service of the deceased. He denied having a hand in the death of the deceased. He denied any dealings with

Atwine, Berwanaho and Bob Mugisha for the purpose of planning and coordinating the death of the deceased. He testified that he never contacted Nabossa (PW13) to kill the deceased. He concluded that his June visit to Uganda was not connected to the plot to kill the deceased at all but was for his private and Social Business.

Charles Berwanaho (A2) also made unsworn defence where he denied the offence. He denied coordinating the plan to kill the deceased. He stated that he was in constant contact with the late Atwine because both of them were involved in a research programme in Wakiso District during the time the deceased was killed and the phone lines which he acquired were for the research project. He conceded that he called Dr Kiyingi from Entebbe when he was doing project work but not for the purpose of coordinating the murder of the deceased. He denied calling Dr Kiyingi on 11-7-2005 as alleged by Nasuna (PW4) in her evidence. He further denied receiving money from Dr Kiyingi to distribute to the killers. All in all, he denied all connections in the death of the deceased.

Bob Mugisha (A3) on his part also made unsworn defence where he admitted that around 19th December 2003 he was deployed together with one Tenywa to guard Dr Kiyingi which they did for only two and half weeks after which they went back to their normal duties when Dr, Kiyingi went back to Australia. After that, he never had any connection with Dr Kiyingi at all. He denied any knowledge of Atwine and Charles Berwanaho and the killer gun.

Lastly, he denied ever escorting Dr Kiyingi to Entebbe together with Charles Berwanaho (A2) and the late Atwine.

The defence relied substantially on the evidence of two witnesses; George William Muwone DW1 whose evidence was that he was a shamba boy at the home of Dr Kiyingi in Buziga. His evidence was that the home of Dr Kiyingi at

Buziga did not lack anything including power and water. He testified that during the time he was at Buziga, life was okay and he did not learn of any plot to kill Robinah Kiyingi. He testified that Nabossa (PW13) did not possess a mobile phone and that Dr Kiyingi used to ring them on landline, which was in the house.

Dr Andama Joseph Dw2 testified that he was a medical officer from Luzira maximum prison who examined the late Atwine. He testified that the late Atwine complained to him that he had been tortured whereupon he treated him. Atwine further complained of stomach pains before he eventually died. He concluded that postmortem from South Africa showed that there were certain chemicals in Atwine's organs, but he stated that he did not know how that had come about.

On the first ingredient, counsel for the accused persons conceded that it had been proved that Robinah Kiyingi is dead. Notwithstanding that concession it is trite law that court must make specific findings on all the ingredients of the offence charged. In the instant case there was overwhelming evidence in proof of the above ingredient. Dr Kiyingi (A1), the husband to the deceased, testified that soon after the death of the deceased, he was informed by his brother in law in London. Upon that information he informed his children and later his relatives and friends in Uganda and instructed them on the burial arrangements. Soon after the death of the deceased, a number of people visited the scene and saw her dead body. These included Eva Kasiryee, (PW2), Mr Bomboka (PW3) Sgt Karugaba (PW8) and D/Corporal Nabetta (PW17). D/Corporal Nabetta in particular was a scene of come officer who visited the scene and took photographs of the deceased at several positions. Post mortem examination of the deceased was done by Dr William Male Mutumba, (PW7) a pathologist, who established that the deceased died of multiple gunshot injuries that resulted

in severe lacerations of the brain, lungs and the heart. Above all, the burial of the deceased was attended by among others D/Sgt Karugaba PW8, Eva Kasirye (PW2). Dr Kibuka (PW10) Samali (PW12) and Dr Kiyingi (A1). It is therefore my conclusion that the first ingredient has been proved beyond reasonable doubt.

The second ingredient is whether the death of the deceased was unlawfully caused. In law every homicide is presumed to be unlawful unless it was accidental or excusable. It is excusable when caused under justifiable circumstances like self defence, of property or person or when authorized by law. The above position was taken since the decision in GUSAMBIZI S/O WESONGA Vs R [1948] 15 EACA 65

It is instructive to point however that it is not upon the accused to prove that the homicide was accidental or excusable in the circumstances. The duty is still on the prosecution to establish that. See: PAULO OMALE –UGANDA, CRIMINAL APPEAL NO 6 OF 1977[COURT OF APPEAL].

In the instant case, there was no evidence to prove that Robinah Kiyingi died accidentally or under justifiable circumstances. Instead the evidence on record proved that she died a gruesome death after being showered with bullets on the head. The photographs taken by scene of crime officer D/Corporal Nabetta (PW17) revealed entry points and exit points of bullets that were showered on the head spilling out the brain matter. According to Nabossa PW(13) the deceased approached her gate as if she was being chased by some people. Soon she heard gunshots as the deceased was crying” Jesus Jesus”. Those gunshots were also witnessed by Mr. Bomboka (PW3) who was immediate neighbour to the deceased. The medical evidence further proved that the cause of death was gunshot injuries. Taking the above prosecution evidence in totality, the presumption that the death of the deceased was caused unlawfully is very high.

The deceased could not have died a natural death. The concession by the defence that the death of the deceased was unlawfully caused was therefore well conceived and justifiable in the circumstances.

The third ingredient was whether the death of the deceased was caused by malice forethought. Malice aforethought is defined under section 191 of the penal code Act to mean:

1. An intention to cause death of any person whether such person is the one actually killed or not; or
2. Knowledge that the act or omission causing death will probably cause the death of some person, whether such person is the person actually killed or not; although such knowledge is accompanied by indifference whether death is caused or not, or by a wish that it may not be caused”

It is clear from the above provisions that malice aforethought is subject of a human mind, which is difficult to prove by direct evidence because what is in the mind of one is difficult to discern by another, but can be inferred from the surrounding circumstances of the incident under investigations. The above theory became law since the decision in the case of R Vs Tubere [1945]12 EACA 63.

In that case and subsequent case, Courts held that malice aforethought can be inferred from:-

- a) the nature of the weapon used (whether lethal or not)
- b) the part of the body targeted (whether vulnerable or not)
- c) the manner in which the weapon was used (whether repeatedly or not)
- d) The conduct of the accused before, during and after the incident (whether with impunity).

In the instant case as in the third ingredient, overwhelming evidence was adduced to show that the deceased was killed by some assailants who way laid her near her gate and showered her with bullets. Photographs of the deceased taken by D/C Nabetta (PW17) showed that there were several entry and exist points of bullets on the body of the deceased. Those who visited the scene which included Dr Eva Kasiryee (PW2), PW2 Mr Bomboka (PW3); D/Sgt Karugaba (PW8) and D/IP Katungi saw the deadly riddled with bullets on the head with the brain matter splashed out. The killer gun was established by Musoki Mwongela PW(9) to be MORINCO TYPE 56 Assault Riffle a Chinese copy of Soviet Kaiashnikov A.K 47 Assault Rifle whose calibre was 7.62 mm which was designed to chamber 7.62X39 mm military rifle ammunition. The above gun is such a precise weapon (although of small destruction) It was tested and found to be functional. Whoever fired it at the deceased at such a close range time must have clearly had an intention to cause her death. Moreover, the assailant(s) fired several bullets on the head of the deceased as was confirmed by Dr Male (PW6) leading to lacerations of the brain, heart and lungs. The head of a human being is a very vulnerable part of the body especially when shot with bullets: See: Okello –Okidi Vs Uganda; Supreme Court Criminal Appeal No 3 of 1995 (unreported).

In that case, (Okello-Okidi Vs Uganda) the deceased was shot several bullets on the head. The Supreme Court confirmed that the assailant in so doing must have had the necessary malice aforethought.

In the instant case, considering the nature of the weapon which was a lethal weapon and the part of the body the assailant(s) targeted, which was the head

and the manner which the gun was used, as several gunshots were fired, one cannot resist inference that whoever assaulted the deceased had the necessary malice aforethought. They killed the deceased in a callous manner oblivious of the plea by the deceased as she was crying for her life in the name of “Jesus Christ”, according to the testimony Nasuna Pw4 and Nabossa (PW13). In conclusion therefore, I agree with the defence and both assessors that the death of the deceased was clearly caused with malice aforethought.

The last and most contested ingredient was the participation of the accused persons in causing the death of the deceased. The prosecution relied on the evidence of the following witnesses in an attempt to implicate the accused persons in this offence:

Musiime Nicholas (PW1), Dr Eva Kasirye Alemu (PW2) , Mr Bomboka (PW3), Nasuna Sadha (PW4), D/Sgt Turyasingura (PW5), D/Constable Ahimbisibwe (PW6).D/Sgt Karugaba (PW8), Dr Andrew Simbwa Kibuka Kiyingi (PW10), Apollo Mutashwera Ntarirwa (PW11); Samali Recho Biyinzika Nakagulire Kiyingi (PW12), Nabossa Prossy (PW13), Rukia Nabirye (PW19), D/IP Katungi (PW21), (PW23) among other witnesses.

There is one issue which I must resolve before analyzing the evidence of the above witnesses. The defence contention was that the evidence of Musiime Nicholas (PW1), Nasuna Sadha (PW4), D/Sgt Karugaba (PW8) and D/IP Katungi (PW21) be excluded for being hearsay, in that all of them relied on what the late private Atwine John had told them. Hearsay consists of statement, which is direct or written by a person who is now not before Court, the purpose

of which is to prove the same that it was made or written. It is second hand evidence, which cannot be subjected to cross-examination and therefore liable to fabrications.

In the instant case the evidence of Nicholas Musiime (PW1) and Nasuna Sadha (PW4) cannot in my opinion be categorized as hearsay as the two witnesses were testifying on facts which they heard from the late Atwine. That category of evidence is provided for under section 59 (b) of the evidence act.

“Oral evidence must, in all cases whatever, be direct; that is to say: -

(a)

.....

(b) if it refers to a fact which could be heard, it must be the evidence of a witness who says he or she heard it.”

Therefore, the evidence of Musiime (PW1) and Nasuna Sadha (PW4) can not be said to be hearsay evidence in so far as they were testifying on what they heard directly from the late Atwine and they were both subjected to rigorous cross-examinations on their assertions. However, the fact that their evidence was admissible does not attach any automatic probative value at this stage i.e. whether or not their assertions were truthful.

As for the evidence of D/sergeant Karugaba (PW8) and D/IP Katungi (PW21), those were police officers who investigated this murder case and assembled evidence which led to the arrest and prosecution of the accused persons. They gave first hand evidence as to how they came to arrest and prosecute the accused persons. Their evidence was therefore very important in this case as

investigating and arresting officers forming the necessary chain between direct or circumstantial evidence available in proof of the allegations on the charge.

I must also add that hearsay rule has become a white elephant in most jurisdictions, being an 18TH century belief that juries were not capable of understanding or giving effect to the basic principles by which judges determine the trustworthiness or reliability of evidence. In Uganda where the roles of the assessors (juries) remain as judges of facts while the judges determine trustworthiness or reliability of evidence and that the opinion of the assessors are not binding on the judges, one wonders why the hearsay rule should still remain as part of our law. In fact, jurisdictions like Canada have come out with reforms in hearsay rule where the Supreme Court of Canada have ruled in a number of cases that hearsay evidence should be admissible on a principled basis, the governing principles being the reliability of the evidence and its necessity: A few cases would illustrate this.

In *R Vs KHAN*, (1990) 2 S.C.R.531; the Supreme Court held that:

“Hearsay evidence of a child’s statement on crimes committed against the child should be received, provided that the guarantees of necessity and reliability are met subject to such safeguards as the judge may consider necessary and subject always to considerations affecting the weight that should be accorded to such evidence.”

The Court held that necessity was to be interpreted to mean “reasonably necessary” and reliability was to be assessed having regard to the characteristics inherent in the evidence, but also the safety of relying on it given the other evidence in the case. In that case, (*KHAN*), reliability was said

to be present because the child had no motive to fabricate the evidence, the statement had emerged naturally and without prompting, it related to matters which the child could not otherwise be expected to have knowledge and was corroborated by real evidence.

In *R Vs Smith*, (1992) 2 S.C.R 915 the hearsay rule concerned the admissibility of three phone conversations between the murder victim and her mother. The Supreme Court reaffirmed the decision in *Khan* thus:

“This court’s decision in *Khan*, therefore, signaled an end to the old categorical approach to the admission of hearsay evidence. Hearsay evidence is now admissible on a principled basis, the governing principles being reliability of the evidence and its necessity.”

The Court further gave reasons for the change which was prompted by the re-evaluation of the capacity of the juries to assess such evidence:-

“.....It would neither be sensible nor just to deprive the jury of this highly relevant evidence on the basis of an arcane rule against hearsay, founded on a lack of faith in the capacity of the trier of fact properly to evaluate evidence of a statement made under circumstances which do not give rise to apprehensions about its reliability, simply because the declarant is unavailable for cross-examination. Where the criteria of necessity and reliability are satisfied, the lack of testing by cross-examination goes to weight, not admissibility and a properly cautioned jury should be able to evaluate the evidence on that basis” emphasis is mine.

About caution the Ontario Court of Appeal in *R Vs A(s)* [1992], 76 CCC (3d) 522 observed as follows:

“In summary, the jury should understand that they must first determine whether the statement was made. If they are satisfied that it was made, they must determine what weight, if any to give that statement. In considering the weight to be given to the statement, the jury must proceed with caution for the reasons set out above, and they must look to the rest of the evidence for indicia, which tend to support or negate the reliability of the statement.

Finally, the jury must be told that having exercised the required caution and considered the statement in the context of the rest of the evidence, it is exclusively for them to decide whether the statement was made and, if so, what weight, if any, to give the statement in their ultimate determination of whether the crown has proved the accused’s guilt beyond a reasonable doubt”

I am highly persuaded by the above Canadian revolution in the hearsay rule as a systematic and analytical development in the law of evidence. Law is a living and progressive subject which should change or be changed in line with progressive contradictions. I am therefore in pains why our Courts of Law should not be free to apply hearsay evidence as long as it is necessary and reliable after cautioning and applying the same in the context of the rest of the evidence on record.

Turning back to the issue of participation of the accused persons in this offence, the evidence which the prosecution relied on was from D/Sgt. Karugaba (PW8), and D/IP Katungi (PW21) who testified that after the murder and burial of the deceased, they received information from Nasuna Sadha

(PW4), that it was the late Atwine John who fired the bullets which ended the life of Robinah Kiyingi on 11/7/2005. The information that time was incriminating Dr Aggrey Kiyingi A1 and Charles Berwanaho (A2) in that Dr Kiyingi was desirous of getting rid of his wife, the deceased and Charles Berwanaho was tasked with the duty of coordinating the whole mission when the late Atwine was arrested by police with the assistance from Nasuna Sadha, he (Atwine) told the police that he had been lured by Charles Berwanaho (A2) to desert the army to come to Kampala and assist in the murder of the deceased who was said to be disturbing her husband, Dr Kiyingi (A1). The late Atwine was promised to be paid a lot of money for the mission and was to be relocated to Australia where A1 was staying. Atwine further gave information to police that Bob Mugisha (A3) had earlier been given the assignment but had failed to accomplish the same to the chagrin of Dr Kiyingi A1 after being paid. That, subsequently he (A3) offered to provide the killer gun which was received from him from the office of Charles Berwanaho (A2) from his office at Agip House, Kampala.

The prosecution also relied on the evidence of Nicholas Musiime (PW1) who testified that he (PW1) housed Atwine a week or two preceding the murder. Musiime Pw1 testified that Atwine told him that he was in Kampala on a mission to kill a wife of a Doctor.

Following the evidence of Musiime PW1 and Nasuna Sadha PW4 the police recovered at the scene a jacket which Nasuna PW4 identified as belonging to her but had been lent by her to the Late Atwine for sometime. The police also recovered at the scene, a map which was showing the direction and geography

of the late Robinah's home. On the map they found fingerprints of the late Atwine which was confirmed by Apollo Mutashwera Ntarirwa (PW11)

From the scene the police also recovered piece of plywood with fake number plates which were identified by Nasuna Sadha PW4 as fake plates which the late Atwine had prepared in her presence and informed her that they were for the purposes of disgusting the actual car plates that were to be used in the murder.

The evidence implicating particular accused persons were as follows:

As far as Bob Mugisha (A2) was concerned, the prosecution led evidence that Bob Mugisha was unofficial guard of Dr Kiyingi up to 2005 according to Nabossa Prossy (PW12). The hub of the evidence implicating Bob Mugisha was mainly from the information that late Atwine gave to the police and that it was Bob Mugisha who provided him with the killer gun from Charles Berwanaho's offices at Agip House. It was at that office that Charles Berwanaho (A2) introduced him to Bob Mugisha (A3). After getting the gun, he took it to Kireka where he erased its serial number and removed the butt. The prosecution evidence was that the late Atwine clearly described bob Mugisha as a police officer who was attached to old Kampala police station and later on identified him in an impromptu identification parade.

Another evidence the prosecution relied on to implicate Bob Mugisha (A3) was from D/Sgt Ahimbisibwe (PW6) who told court that sometimes in May 2005 while in the company of Bob Mugisha A3, and a police woman constable Maganja as they were walking towards the Car Park, Bob Mugisha received a call and stopped to talk on his handset. After talking on his phone he rejoined

them and told them that he had a friend of his abroad who had a girlfriend in Kampala who had conned him of a lot of money and wanted to find away of killing her and wanted his assistance. That Mugisha Bob told them that the mission involved a lot of money and that he was going to get a gun from a constable. PW6 further testified that on 12/7/2005, a day after the murder of Robinah Kiyingi two young men went looking for Bob Mugisha at Old Kampala police station. Soon after, he (PW6) saw in the Newspapers after the arrest of the accused persons the very picture of one of those young boys who had gone to the station looking for A3 a day after the murder. He said that the brown one was Atwine who was putting on a blue T-shirt in the Newspaper.

Another prosecution witness was D/IP David Turyasingura (PW5) who testified that on 17/7/2005 while at old Kampala Police station reading News papers he commented in the presence of Bob Mugisha that Dr Kiyingi did bad to kill his wife. Upon hearing that, Mugisha told him that he knew the killers of the deceased. He pleaded with Mugisha so that the law could take its course and also that he could benefit from the 5 million shillings the police had staked on information leading to the arrest of the murderers. Mugisha however refused to disclose claiming that the family of Kiyingi was very rich and would kill him if they got to know that he had revealed the killers. He testified that he was surprised that the next day he heard that Bob Mugisha had also been arrested in connection with the death of the late Robinah Kiyingi.

The prosecution further relied on the evidence that towards the murder all the parties to the murder acquired other numbers which were for strict use with regard for the mission so that they were to act in a discreet manner such that in

case of any problem. They would not be put together. That was why Bob Mugisha was found with a sim card on top of usual numbers.

As for Charles Berwanaho, (A2) the prosecution relied on the evidence of Nasuna Sadha (PW4) who told Court that in March 2005, she met the late Atwine who was her former schoolmate and a village mate in Bushenyi. The late Atwine told her that he was a soldier in the army attached to Gulu. After that meeting Atwine stayed in Kampala for two weeks and went back. Shortly after, Atwine returned to Kampala and told her that he was staying with a friend of his. Atwine told her that he returned to Kampala because his brother Charles Berwanaho A2, had a deal and wanted his help. In the month of June 2005 the late Atwine disclosed the deal to her that Charles Berwanaho A2 had a doctor friend who had someone he wanted to kill and that the lady had sold off the doctor's container and that the woman was a lawyer and was disturbing the new wife the doctor had married. So the deal was to kill her (the lawyer woman) that she tried to trace that lawyer but failed. Her evidence was that Atwine stayed in Kampala for about two months at the expense of Charles Berwanaho A2 who was the Chief coordinator of the mission. During that time Atwine and Berwanaho were communicating very constantly. The surprising thing was however that whenever Atwine wanted to talk to Berwanaho, he would beep him using Nasuna's phone and erase the number. Then Berwanaho would call but Atwine would hide his number. That meant that the parties were secretive.

Atwine's information to the police investigation officers was that it was Charles Berwanaho who

had introduced him to Bob Mugisha who provided the killer gun to him and one Bernard who went with him to the death point as a backup hit man.

The police information was that it was Berwanaho (A2) who drove the assailants to the scene and kept them there.

According to the police investigations as evidence by D/C Sakwa (PW23) as the day of the murder was approaching, the late Atwine, Dr Kiyingi and Charles Berwanaho acquired other numbers. That on 1/6/2005 Charles Berwanaho who initially had two lines later, and for the purpose of this mission acquired Celtel No. 075896311 and on the same day acquired another line 075-205532. The later number was in use up to 15/7/2005 and then abandoned. That was the date Dr Kiyingi was arrested by police. On the same date, 1/6/2005 the late Atwine acquired cellphone No 075-991327 which he used up to 11/7/2005 at around 8.00am. That day was the day of the murder of the deceased. That line was later on abandoned by the late Atwine. On the other hand, Dr Kiyingi also acquired a new line on 3/7/2005 which was No 075-980608 which he strictly used only for that date. Dr Kiyingi also used his known telephone line on the same day.

D/C Sakwa (PW2) testified that on that date, 3/7/2005, Dr Kiyingi used 075-80608 to communicate to Charles Berwanaho on his (A2) newly acquired No 075-205532. D/C Sakwa testified that that day Dr Kiyingi was leaving the country and he was with Charles Berwanaho (A2) at Entebbe Airport, having come to Uganda on 20/6/2005. The reason for Dr Kiyingi's coming to the country according to Nasuna Sadha (PW4) and Atwine's information to police, was to bring in money to pay the killers and also to make final arrangements.

According to Nasuna Sadha (PW4) it was Charles Berwanaho A2 who called Atwine on 3/7/2005 at 4.00p.m. when Atwine was in Mukono with her (Nasuna).

Nasuna PW4 testified that after receiving the call Atwine told her that it was Charles Berwanaho who had called him instructing him to rush to Entebbe to go and escort Dr Kiyingi and that Atwine left immediately on receipt of that call. The extracted print-out by police (exhibit P24(15) showed that Atwine was called on his phone No 077-617849 by Charles Berwanaho on phone No 075-205532.

Further more the evidence implicating Charles Berwanaho A2 was that according to exhibit P24 on 13 /7/2005 two days after the murder at 1202 pm telephone No 071-326345 which belonged to Charles Berwanaho called Nasuna Sadha (PW4) on No 077-606212 to talk to Atwine

According to Nasuna Pw4 on receiving that call Atwine was panicky and immediately got a taxi and left Nakawa for Kireka.

Lastly the evidence of D/Sgt Karugaba (PW8) and D/IP Katungi (PW21) was that when Charles Berwanaho learnt or suspected that police were looking for him, he kept away from his home and never slept at his home in Kyambogo until he knew that the police had apprehended his wife that he was compelled to report himself which was not a voluntary conduct as he alleged.

As for Dr Kiyingi A1 the evidence and contention of the prosecution was that he had motive (though not necessary in criminal trial) to kill his wife, the deceased because of two reasons: Their marriage had been on the rock for long and he wanted to remarry and was already cohabiting with a young lady. He

had already petitioned for a divorce which was surprisingly opposed by the deceased which did not go down well with the accused.

Another reason was that Dr Kiyingi was disgruntled about the deceased sharing his property after their separation. So the only solution was to kill the deceased. The prosecution relied on the evidence of Nicholas Musiime (PW1), Nasuna Sadha (PW4) and D/Sgt Ahimbisibwe that the theory below the death of the deceased by Dr Kiyingi was property concern and his desire to remarry. The evidence of Nicholas Musiime (PW1), was that Atwine had told him that Dr Kiyingi wanted his wife dead because they had misunderstanding. Nasuna Sadha (PW4) and D/C Ahimbisibwe that the theory below the death of the deceased by Dr Kiyingi was property concern and his desire to remarry. The evidence of Nicholas Musiime (PW1) was that Atwine had told him that Dr Kiyingi wanted his wife dead because they had misunderstandings. Nasuna Sadha (PW4) on the other hand testified that Atwine told her that a certain Doctor wanted to kill his wife because she had grabbed his property and was disturbing her- co -wife while the evidence of D/C Ahimbisibwe (PW5) was that Bob Mugisha told him after communication with some one on phone that he had a friend of his living outside the country whose girlfriend had conned him and so he wanted a way of killing her.

In support of the above theories the prosecution relied on the evidence of past threats by Dr Kiyingi on the deceased. It was the evidence of Dr Eva Kasirye Alemu (PW2); Dr Kibuka Kiyingi (PW10) and Samali Kiyingi (PW12) that in 2001 Dr Kiyingi pointed a gun at the deceased and threatened to kill her after finding her with a 19-year-old Christian praying in the family home. Again in

2001, after the deceased was convinced by Dr Kiyingi to stay with him in Australia, she expressed fear on her life to her children Kibuka PW(10) and Samali (PW12) after Dr Kiyingi had told that he could kill her and no one would know. The deceased further reported to Dr Eva Kasirye (PW2) that sometimes after the burial of her mother in-law, Dr Kiyingi threatened to kill her with a spear. That incident was also said to have happened in 2001.

Nabossa Prossy (PW13) testified that around 2002 and 2003, when she was employed as a housemaid to the family of Dr Kiyingi at Buziga, Dr Kiyingi contacted her to request her to kill the deceased but she rejected the request being a born again Christian and reported the incident to the deceased. She testified that Dr Kiyingi enticed her with a phone and shs. 200,000/= but she declined the request to kill the deceased and instead advised Dr Kiyingi to reconcile the marriage. Nabossa testified that Dr Kiyingi had promised her heaven on earth. On top of money she was to be built a house and Dr Kiyingi was also prepared to pay school fees for her child.

Another evidence of past threats was that in 2003 Dr Kiyingi through his nephew Laban Kiwanuka contacted some soldiers to kill the deceased but the plan aborted because the soldiers disclosed the plan and the deceased got wind of it and informed her sister Dr Eva Kasirye Alemu (PW2) and her children, Dr Kibuka (PW10) and lawyer Samali (PW12). She wrote a letter to that effect (exhibit P11) implicating Laban Kiwanuka and Dr Kiyingi. Laban Kiwanuka's threat was supported by Nabossa Prossy (PW13) and the conduct of the accused in trying to exonerate him through a forged letter from the DPP (Exhibit P12).

The prosecution further alleged that the conduct of Dr Kiyingi prior to the murder, was suspect in that he came to Uganda secretly on 29/6/2005 and left on 3/7/2005.

According to the evidence of Nasuna Sadha (PW4) and Atwine's information to the police, the purpose of that visit was to bring in money to be used in the murder. Prosecution contended that the fact that Dr Kiyingi was with the late Atwine and Charles Berwanaho at the Airport on that day confirmed that he had brought the money. They relied on print out Exhibit P 24(3), P 24(9) P 24(15).

Another allegation on the conduct prior to murder was that on 3rd July 2005, a week before the murder, Dr Kiyingi went stealthily without knowledge of the deceased and removed valuable property from the matrimonial home, according to Prossy Nabossa (PW13). Among them included TV, radio set and loud speakers. The deceased did not know that her husband was within the country. The deceased told the presence of the accused to her sister Dr Eva Kasiry Alemu (PW2) to whom she expressed fear about her life.

The prosecution also asserted that Dr Kiyingi (A1) withdrew guards from the Buziga home so that he could be in control of the home so that the planned mission could succeed after removing those who were close to the deceased.

The prosecutors further relied on the allegations that Dr Kiyingi A1 never communicated to his in-laws on 11/7/2005 about the unfortunate incident but instead offered to call other people like Sam Kagulire Lwasa and Prince Nakibinge. On top of that it was also prosecution evidence that Dr Kiyingi further failed to greet his in-laws at the funeral and yet he greeted other mourners. Further more, it was the evidence of his daughter Samali (PW12) that her father Dr Kiyingi never comforted them as mourners and that his speech during the funeral service was as if he was not bereaved. The speech never embraced sorrows. It was as if it was a baptism service for the children because he never talked about the deceased.

The prosecution further relied on the evidence of D/Sgt Karugaba (PW8) that Dr Kiyingi was suspected because his itinerary showed that he arrived in Uganda on 13/7/2005 and was to leave Uganda on 15/7/2005 which to them, was strange for a bereaved spouse of mother of his children to plan his travel in such a way. D/Sgt Karugaba PW8 and Nasuna Sadha PW4 further stated that on 17/7/2005 Dr Kiyingi received a call when he was at CID Headquarters from the killer Atwine on phone No 041-541525 and that same number thereafter called Nasuna Sadha PW4 who was also at the CID Headquarters and on receipt of that call and on realizing that call the was from Atwine, Nasuna switched the call to hand free and everybody including D/Sgt Karugaba and D/IP Katungi (PW2) heard that conversation between Atwine and Nasuna. The prosecution contended that the communication was because Atwine was demanding his balance for the mission.

Lastly, the prosecution relied on the evidence that the in Atwine's notebook; the telephone number of Dr Kiyingi was noted in one of the pages to prove that he was in contact with the late Atwine.

From the above evidence it is clear that there were no eye witnesses to the gruesome killing. The evidence implicating the accused persons were therefore based on a chain of circumstantial evidence. The law on circumstantial evidence was well taken by Ssekandi J.A (as he then was) in his lead judgment in *Amisi Dhatemwa Alias Waibi Vs Uganda*, criminal appeal No 23 of 1977, in terms set below:

“It is true to say that circumstantial evidence is very often the best evidence. It is evidence of surrounding circumstances which, by undersigned coincidence is capable of proving facts in issue quite accurately, it is no derogation of evidence to say that it is circumstantial; See: *R Vs Tailor, Wever and Donovan*, 21 Criminal Appeal R 20.

However, it is trite law that circumstantial evidence must always be narrowly examined, only because evidence of this kind may be fabricated to cast suspicion on another. It is therefore necessary before drawing the inference of the accused guilt from circumstantial evidence to be sure that there are no other co existing circumstances, which would weaken or destroy the inference....

The burden of proof in criminal cases is always upon the prosecution and a case based on a chain of circumstantial evidence is only as strong as its weakest link”

Recently the Supreme Court reaffirmed the above position of the law in the case of Janet Mureeba and 2 others-Vs Uganda, Supreme Court Criminal Appeal No 13 of 2003 as follows:

“There are many decided cases which set out tests to be applied in relying on circumstantial evidence to sustain a conviction; the circumstantial evidence must point irresistibly to the guilt of the accused. In R -Vs- Kipkering Arap Koske and Another [1949] 16 EACE 135 it was stated that in order to justify, on circumstantial evidence, the inference of guilt, the exculpatory facts must be incompatible with the innocence of the accused and incapable of explanation upon any other reasonable hypothesis than that of guilt. That statement of the law was approved by the East African court of Appeal in Simon Musoke Vs R[1958] EA 715 and see: Bogere Charles (Supra).”

Bogere’s case is very instructive on this issue in that the court observed that:

“the circumstances must be such as to produce moral certainty to the exclusion of every reasonable doubt”

In conclusion therefore the above authorities clearly set out how courts should square up while dealing with circumstantial evidence.

Having stated that relevant position of the law, I now proceed to appraise the evidence on record. As far as Dr Kiyingi is concerned, a chain of circumstantial

evidence was raised against him by the prosecution. Among them was past threats on the life of the deceased. The law is that past threats on the deceased by his or her assailant can be good evidence leading to conviction. However, there must be sufficient proximity between the threats and the occurrence of the death in order to form a transaction. See MUREEBA (Supra). If the threat is too remote in terms of time and transaction, then it would not constitute circumstances of the transaction leading to the death of the deceased. The Court held further that circumstances must be circumstances of a transaction. General expression indicating fear or suspicion, whether of a particular individual or otherwise and not directly related to the occasion of the death was held not to be admissible.

In the instant case, it was contended that the marriage between the couple had fallen on the rocks whereby even the enormous wealth, which they had, could not redeem it. Between 2001-2003 the marriage was characterized by threats, abuses, hatred and mistrust to the extent that the deceased continued to live under constant threat to her life until her death. Those threats occurred two years prior to this incident, to say the least, I think those threats offered during the above period were too remote to constitute a transaction in the death of the deceased. They were not proximate in view of the time lag. Save perhaps for Laban's incident, the other threats and abuses were manifestations in the wear and tear in the marriage relationship. Furthermore, there was no evidence to prove that Dr Kiyangi continued to threaten his wife or that he continued to request his maid to help in doing away with the deceased.

Unlike in Mureeba's case where there were persistent threats on the life of the deceased by way of telephone threats and physical harassments, in the instant case, there was no evidence to show that the accused was in overt pursuit of threatening the deceased. Even when the accused was said to have

sneaked into the country, there was no evidence that he made attempts to threaten the deceased by telephone contact or otherwise. Therefore, the fear that the deceased expressed for her life when the accused sneaked into the country on 29/6/2005 was just a general expression of fear and suspicion, which needed corroboration. Therefore, I find the above chain of circumstantial evidence to be of a very weak nature.

There was an assertion that the conduct of the accused was not that of an innocent person. First of all, it was the prosecution evidence that the accused did not communicate the death of the deceased to his in-laws, did not console and comfort the children and his away of booking a return journey two days after the burial was not conduct of a bereaved husband.

The accused in his defence stated that after receiving the bad news of the death of the deceased from his brother in law, One Semanda from London, he was shocked, confused and disorientated but after a while he recollected himself and contacted his two sons, Dr Kibuka and Kirabo and later his daughter, Samali and started making travel arrangements to fly to Uganda. Later he contacted relatives and friends in Uganda to make burial arrangements.

The defence of the accused was further that after arriving in Uganda on 14th July 2005. He proceeded to his Buziga home where he got mourners. However he was shocked at the cold reception from his in laws, many of whom did not want to speak to him except his father in law, who consoled him in the Kiganda fashion-“Kitalo Nyo” The accused told court further that thereafter he summoned the children to the master bedroom including his two daughters, Samali and Sanyu whom he found already at Buziga and consoled them and they prayed together.

Lastly the accused denied failure to mourn the deceased. He told court that he was degraded, humiliated and prevented from mourning the deceased in that

during the funeral service, Hon Tim Lwanga bluntly prevented him from consoling and hugging his children by shielding and pushing them away from him. Earlier on, the same Tim Lwanga together with Dr Eva Kasirye (PW2) and Samali (PW12) had requested the clergy at Namirembe Cathedral to block him from addressing the congregation during the memorial service of the deceased.

I do agree, with the defence that with the above kind of treatment, even a man with the hardest character would not have contained the embarrassment and humiliation. The accused told court that although the clergyman in their God given wisdom gave him opportunity to speak, his heart was already too heavy to sustain a good speech, but all the same, he spoke within the context of the occasion. The above defence which the accused made in a calm and composed mood is quite plausible and believable.

Apart from the above defence, the accused further told court that because over traveling and staying without proper sleep for very many hours, he was in a state of fatigue such that he could not make a good speech in the circumstances. I have considered the evidence as outlined above. People express grief in many ways. In fact, there is no standard form of grief unless it is being orchestrated. Some cry others don't. Some break down in grief while others stand up to the grief. Therefore, to attach the guilt of the accused to the type of speech he made at the funeral service clearly lacked moral certainty. That chain of evidence should accordingly be discounted for being weak and uncertain because it did not rule out the human weakness of the accused: See Bogere Charles -Vs- Uganda, Supreme Court criminal Appeal No 10 of 1998.

The prosecution engine was based on the evidence of Musiime Nicholas PW1, Nasuna Sadha PW4 and the police investigation team comprising of D/ Sgt Karugaba PW8, D/IP Katungi (PW21) and D/C Sakwa (PW23).

The evidence of Nicholas Musiime (PW1) Nasuna Sadha (PW4) D/Sgt Karugaba (PW8) and D/IP Katungi (PW23) all relied on the revelation which the late Atwine had made. However, the evidence of Musiime (PW1) and Nasuna (PW4) suffered a serious blow in assessment of their truthfulness with the death of the late Atwine John who was one of the suspects in this case. However, that misfortune could not bundle completely the evidence of the two witnesses as worthless as long as there was other evidence which when tied together could irresistibly point to the guilt of the accused persons.

One of such evidence could have been if the state had tied the death of Atwine on the accused persons. But here the state was more to blame than the accused because it was its duty to keep Atwine safe in custody. As mentioned earlier, the evidence D/Sgt Karugaba (PW8) and D/IP Perez Katungi (PW21) constituted evidence of investigating officers which was vital as foundation evidence in support of prosecution case. However, the evidence of these witnesses like those of Musiime and Nasuna were barren of evidentiary value without the necessary corroborative evidence. The information which Atwine made to the above officers were not confessions because they were not made under charge and caution. Even if they were, their truthfulness would have first been tested and refined before admission.

In an attempt to harness the evidence of the above witnesses, the prosecution relied on the assertion that, towards the execution of the murder mission the accused persons acquired telephone lines, which they used strictly for the mission and discarded soon thereafter. The prosecution relied on the evidence of D/C Sakwa (PW23) who was a specialist in analyzing telephone printouts from service providers. Using great skill and expertise, D/C Sakwa (PW23) presented telephone printouts covering the period before and after the murder of the deceased.

However, according to D/C Sakwa, the printout revealed that no calls had ever been made by DR Kiyingi to Bob Mugisha; there was no call made by Dr Kiyingi to the late Atwine, there was no call made by Bob Mugisha to Dr Kiyingi or Charles Berwanaho or to the late Atwine and vice versa

The print-outs further revealed that there was no international call made by Charles Berwanaho to Dr Kiyingi and yet it was alleged by the prosecution witness that soon after the mission was accomplished, Charles Berwanaho phoned Dr Kiyingi to inform him accordingly where he was said to have expressed his happiness. The shortfalls in the printouts created a hole in this case. The only contact, which the printouts revealed, was between Charles Berwanaho and his brother the Late Atwine. The defence explained that that was a normal contact between blood brothers. Charles Berwanaho explained further that during that period, he was carrying on research together with the late Atwine. That was why they were in close contract. The prosecution called the evidence from service providers i.e. MTN, Celtel and Mango. All these witnesses (PW26, PW25 and PW24) confirmed that their systems did not have the capacity to listen to telephone conversations. This should have been a useful advancement in detecting crimes. Those service providers also alluded to the shortfalls in the printouts about telephone contacts between the accused persons.

The only evidence which the prosecution brought against Dr Kiyingi in respect of telephone contacts was through D/Sgt Karugaba (PW8) Nasuna Sadha PW4 and D/IP Katungi (PW21) that on 17th July 2005 Dr Kiyingi received a call when he was at CID headquarters from the late Atwine on phone No 041-541525 and that the same number thereafter called Nasuna Sadha who was also

at the police headquarters and on receipt of that call and or realizing that the call, was from Atwine, Nasuna switched the call to hands free whereupon everybody including D/Sgt Karugaba and, D/IP Katungi heard the conversation between Atwine and Nasuna. The prosecution contended that the conversation between Atwine and Dr Kiyingi was because Atwine was demanding his balance. But one cannot be certain about the authenticity of this conversation. That was the first time both Karugaba and D/IP Katungi were hearing the voice of the late Atwine if ever he was the one speaking at all. Moreover, the call was from a payphone. Therefore, it is possible that Nasuna could have been talking to anybody. More-over I am very reluctant to trust the credibility of this Nasuna in light of the fact that she could not reveal the plot to kill the deceased to the local or public authorities at the earlier opportunity and yet she was said to be having a very prominent uncle in the Police Force, One Asuman Mugenyi who was by then heading public relations department of the Police Force. If she could reveal the same to a stranger, it could have been much easier for her to have reported the same to the said officer. It is therefore doubtful whether she even made efforts to save the life of the deceased as she claimed. Moreover, the testimony of Nasuna also failed to tally with other prosecution evidence. Her reasons for the killing of the deceased were different from the version, which Atwine was said to have given to Musiime. She also told Court that Atwine had told her that Dr Kiyingi booked him in a posh room in Entebbe. This however conflicted with the evidence adduced by D/C Sakwa (PW23), which was that the late Atwine never slept in Entebbe. This among others, throws doubt on the prosecution theory. At this juncture it is instructive to recite the case of *Woolmington-Vs-DPP* [1935] AC 662:

“ Just as there is evidence on behalf of prosecution so there may be evidence on behalf of the accused which may cause doubt as to his guilt. In either case he is entitled to the benefits of doubt.

But while prosecution must prove the guilt of a prisoner. There is no burden laid on the prisoner to prove his innocence. It is sufficient for him to raise a doubt as to his guilt. He is not even bound to satisfy the jury as to his innocence”

The above case has been followed in number of jurisdictions including Uganda See: SEKITOLEKO-VS-UGANDA [1967] EA 531.

In Australia the same case was applied with approval in the case of Green-V-the Queen [1971] C.L. R 28, in the following terms:

“The burden of proof, as you well know, is on the Crown and it is on the Crown in respect of every issue in respect of every element of the crime. Well, now before you say you are satisfied for the purpose of a verdict about a certain issue, you of course have to reach a certain degree of satisfaction in your mind, and what degree of satisfaction must be reached?” The answer is that you must be satisfied beyond reasonable doubt and that is the time - honoured phrase and is usually thought to be very good work in seeing that no body is convicted of a serious crime unless the Court that tries him is satisfied of his quilt beyond reasonable doubt. And you may say “well how do I know when I have got to a stage of being satisfied of his guilt beyond reasonable doubt?” and the answer to that is that it is when you have reached the stage that you either have no doubt at all, because you have got rid of all reasonable doubts; or if there is something nagging in the back of your mind which makes you hesitate as to whether you are satisfied beyond reasonable doubt, you have got to try and take

it out and identify thing which is causing the hesitation, causing the doubt if you like, and you have a look at it and you try to assess it and you say to yourself is this doubt that is bothering me, does it proceed from reason; is it a rational doubt is it something which raises a really sensible doubt; or is it a fantastic sort of doubt, is it something which arises from some prejudice that I may have, some quite unreasonable fear that I might go wrong, some perhaps reluctance to make an unpleasant finding. Well if it is one of those doubts then of course it cannot be described as reasonable doubt because it does not come from reason, it comes from something which is emotional or irrational or at any rate it is not based on reason and if you have had a look at what is bothering you and you decide that it does proceed from something which is not reason but something fantastic or rising out of prejudice or one of these other things, then you should say to yourself.

“ the only doubt I have got is one which is not based on reason”

And of course it is commonsense point of view before you find anybody guilty of crime like this, you need to feel comfortable about it, you need to feel” very well I have considered everything and I am well satisfied. I am satisfied beyond reasonable doubt. I have given it the best consideration I can” And then you go away from the court and you are comfortable, and that is the way you ought to be. You may not enjoy it, but you will nevertheless be comfortable and unless you can make a decision of guilt and feel comfortable that is the right Decision” Emphasis mine.

The above quotation is very inspiring, highly persuasive and very instructive to the instant case. The finding of guilt should only be based where there is no doubt or if there is doubt, the doubt must be based on reason and not prejudice,

fear or reluctance to make unpleasant finding. In other words the finding of guilt must not be like Pilato's biblical trial of Jesus Christ.

Taking the prosecution evidence in this case in totality and the defence, which Dr Kiyingi raised, my mind is still left nagging whether he committed the alleged crime. The truthfulness of evidence of Musiime Pw1 and Nasuna Pw4 could not be fully established due to the sudden death of the late Atwine. The allegations that the accused persons acquired a number of telephone sets to coordinate the mission was not established by the prosecution to the required standard. This being a very serious crime, court ought to be certain beyond reasonable doubt. The law in its usual kindness in that it is safer to let 99 criminals free than to convict one innocent person. Experience abound where innocent people have been convicted recklessly. Although it was not his duty to prove his innocence, Dr Kiyingi made a formidable defence, which created a huge cloud of doubt on the prosecution case. He destroyed the allegation that during the eve of the murder he had sneaked into the country to bring in money to pay the killers. His explanation was that he had come to do his private business and to perform a social function. He had been invited as a guest of honour in a social function during the launching of Nagujja's album where his company was the sponsor. I have no reason to disbelieve that explanation. If the accused had come to finance the said deal, at least some part of the money could have been recovered from one of the accused person because the deal was said to have involved a lot of money. However not even 100,000/ was recovered from the late Atwine or Charles Berwanaho, who was said to be the one who was charged with the distribution of the said funds.

The accused also explained that his return schedule had nothing to do with his guilt as that was a provisional booking. He also denied withdrawing electricity

and security services from the house. In totality, the alibi which the accused was not bound to prove in law created a huge doubt in the prosecution case.

For the above reasons and others already outlined, I find this case has not been proved beyond reasonable doubt and I therefore would not feel comfortable to convict the accused. The evidence on record merely leaves the accused as a high suspect in the death of his wife. But the law is very straight on that point, suspicion however high it may be can never be a basis for conviction. See: *R Vs Israel Epuku s/o of Achietu*. The circumstantial evidence against the accused did not point irresistibly at the accused unlike in the *Mureeba* case (supra) where after the death of the deceased, the accused was heard rejoicing that the Malaya who was after her husband was now dead. And she proceeded to engage a witch doctor to help her out of trouble after the murder, but in the instant case, however the circumstantial evidence could not be tied around Dr Kiyingi. The evidence as pointed earlier left the accused as a high suspect. It was not water tight as required by law. Therefore, having failed to prove this case to the required standard and this being a very serious crime, I would feel very uncomfortable in convicting the accused. In agreement with both assessors, I find Dr Kiyingi not guilty on the charge. He is accordingly acquitted.

As far as the 2nd and 3rd accused persons are concerned, the prosecution relied on the same evidence to implicate both of them. With regard to the 2nd accused Charles Berwanaho prosecution further relied on his conduct of hiding from the police team upon realizing that he was under probe. In his defense, Charles Berwanaho denied ever hiding and told court that the previous night he had not evaded police arrest but had spent the night at the home of his mistress and that upon realizing that he was wanted by police, he decided to report himself to the police. Further defence was that during the material time he was carrying on a

research on Aids, which was being funded by the Global Fund. At that time he was carrying research in Wakiso together with the late Atwine. He conceded that in the process he was in constant touch with the late Atwine on phone. He denied making an international call to Dr Kiyingi. The issue of international call between Dr Kiyingi and Charles Berwanaho was ruled out by the printouts, which the prosecution laid before this court. The accused also made a plausible account of his presence in Entebbe during the material time that he was there doing his research. Therefore, the possibility that the accused was in Entebbe, not on account of Dr Kiyingi could not be overruled.

As for the conduct of the accused that he evaded arrest I am satisfied with his explanation that during the night in question, he had slept at the home of his mistress in Kyambogo and only managed to return in the morning and when he learnt that he was wanted by police he reported himself to the police headquarters. I think it was irrational to make adverse inference on the conduct of the accused person because if at all he had intended to hide from the course of Justice he would not have reported himself to the police headquarters, purportedly to rescue his wife who had been arrested by the police. But I must also say that the conduct of arresting the wife of the accused who had nothing to do with this crime tantamounted to high handedness. A person should only be arrested for the crime he or she has personally committed but not for crime committed by another person, not even that of a spouse.

Another reason the accused related for the constant communication with the late Atwine was that they were brothers. The blood relationship between the two was even confirmed by the prosecution. The accused also testified that there was employee-employer relationship between him and Dr Kiyingi, which would prompt them to communicate to each other whenever it was necessary. All the reason above clearly set out the weakest link in the circumstantial

evidence relied on by the prosecution because the links gave other co existing circumstances which would weaken or destroy the inference of guilt. See: WAIBI (supra). Furthermore, if it is true that the assailants had used Charles Berwanaho's motor vehicle to the scene, why was it that the prosecution failed to identify its registration number? If the information from Atwine was to go by, then he should have been in a position to identify that motor vehicle because that was his brother's vehicle.

Lastly, I have to deal with Bob Mugisha A3. Again as for the other two accused persons, the evidence against this accused is of a very weak nature. In addition to the witnesses whose evidence I have already analyzed in respect of the other two accused persons, the prosecution relied on the evidence of D/Sgt Turyasingura (PW5), and D/C Ahimbisibwe (PW6). The evidence of D/Sgt Turyasingura (PW5) was that the accused never revealed the names of the assailants a part from saying that he knew the killers. In the testimony of D/C Ahimbisibwe (PW6) the accused never made specific reference as to the doctor from a broad who was planning to kill his girlfriend. The evidence of the two witnesses were therefore speculative and needed very strong corroborative evidence which the prosecution failed to adduce.

All in all, the prosecution case failed the standard required in criminal justice, to prove this case beyond reasonable doubt. That standard is very high. The court is not bothered by the strength or weakness of the defence as was the point in PAULO OMALE -Vs- UGANDA CRIMINAL APPEAL No. 6 of 1977 where the defunct Court of Appeal for Appeal for Uganda had this to say: "It is for the prosecution to prove beyond reasonable doubt that the prisoner with malice aforethought killed the deceased. It is not for the prisoner to prove accident or self defence and he is entitled to be acquitted even though the court

is not satisfied that his story is true, so long as the court is of the view that his story might reasonably be true”

For the above reasons, I agree with the unanimous decisions of the lady and gentleman assessor that the accused persons should not be found guilty. The accused persons are accordingly acquitted and set free.

Order:-

Any money paid for bail be refunded to the accused persons.

RUBBY AWERI OPIO

JUDGE

Judgment read in open court in the presence of both defence and prosecution attorneys.

RUBBY AWERI OPIO

JUDGE.

11/12/2006.

CHAPTER SEVENTEEN



THE NEED FOR A CRIME SCENE EFFICACY USING UGANDA CASE LAW

The chapter aims at gathering qualitative data on the impact of crime scene Management onto the investigation process in Uganda. The management of evidence collected from crime scenes in murder cases has led to the rampant acquittal of murder cases. Crime scene Management institutions in Uganda are challenged with equipment of the Forensics centre, inadequate resources, and the high, expensive as well as dynamic demands for resources, inadequate training of Ugandan scientists in modern forensic investigation. There are a number of persisting factors in Uganda that sometimes culminate into incorrect and misleading forensic examination results that are used in evidence in courts of law. Examples of such factors include corruption / undue influence, poor facilitation and time management, poor forensic facilities / equipment, incorrect methods of forensic evidence collection and examination. In Uganda there is no centralized body that regulates the functions of forensic experts. Whereas Uganda has forensic laboratories, these laboratories are almost un-equipped, there are not enough materials, and even those who work there have not received adequate training.

The author has therefore recommended that the States requires that all forensic science laboratory analysts receive proper training and certification; trains more of the experts in this area to ensure effective performance of duties in the interest of criminal justice in the country; take care of these people who have the capacity and the education necessary to be forensics scientists, send them abroad, so that they can be well formed for fear that one day the country will be found that he has no forensic scientist capable of carrying out an investigation; improve the conditions under which these materials are given; and trains the police officers and the investigators can be well trained and that if necessary that they can send some of them abroad in order to obtain a better formation. And that, moreover, a good equipment is available to them.

This chapter discusses the challenges faced by collection of physical evidence from crime scene in murder cases. Crime scene investigation is a process that aims at recording the scene as it is first encountered and recognizing and collecting all physical evidence potentially relevant to the solution of the case.⁶⁷ A crime is the immediate vicinity of area where an offence has been committed providing evidence. A Crime scene may be classified into primary crime scene which is the immediate vicinity of the occurrence within which evidence might be found and secondary scene is an area which may not be in the immediate vicinity of the primary crime scene,

⁶⁷ UNDOC; Crime Scene and Physical evidence Awareness for non-forensic personnel (2009, Vienna)

still may afford evidence thereby linking the offenders with the offence.⁶⁸

Crime scene investigation is traced as far as 1750. It is in that year that Henry Fielding created a small group of volunteers in London, referred as the “Bow Street Runners”. These volunteers hurried to scenes of reported crimes and began investigations, thus becoming the first modern crime scene detectives (Swanson et al., 2003:4). Crime scene investigation, as it is known today, dates back to the 17th century in China, where a Chinese team of investigators evaluated crime scenes, examined physical evidence and interviewed witnesses and suspects (Owen, 2000:13).

The first police crime laboratory was established in 1910 in Lyon, France, by Edmond Locard. According to Locard’s “exchange principle,” it is impossible for criminals to escape a crime scene without leaving behind trace evidence that can be used to identify them. That principle gave rise to the forensic sciences, which are the accumulated methods for developing and analysing physical evidence from crime scenes. Crime- scene investigation, which is often performed by experts known as crime-scene investigators (CSIs), involves the careful gathering of such evidence, which is then analysed at a crime laboratory. In some cases, evidence gathered by CSIs and analyzes by forensic experts is the only incontrovertible evidence presented at trial.

⁶⁸ Steve Mbugua; Introduction to crime scene management; Makanika Africa international; Pg.1

The role of forensic science services starts at the crime scene with the recognition and recovery of physical evidence. It proceeds with its analysis and the evaluation of the results in a laboratory, and the presentation of the findings to judges, prosecutors, lawyers and others in need of the factual information. From the first responders to the end-users of the information, all personnel involved should have an adequate understanding of the forensic process, the scientific disciplines and the specialized services provided by forensic laboratories. The first responder(s), be they law enforcement officers, human rights officers or anyone else, play a critical role in the entire crime scene investigation process. Their initial responsibilities are to preserve the integrity of the scene and the evidence. Furthermore, they are responsible for the early documentation of the crime scene, its evidence and all activities at the scene. As in the majority of cases first responders are non-forensic personnel, adequate training to carry out these tasks is critical.

However, it was only during the 1970s that crime scene investigation gained popularity. In the Management of forensic evidence started with the creation of the Forensics directorate a few years back and taking it from under the roof of CID so it could run faster on its own. A few pioneers were brought in by the police leadership to kick off the reform, starting some four years back. The team was led by Lenny Mugalu, an experienced biochemist who after a teaching stint at Makerere University in the early eighties had led quality control for top pharmaceutical organisations like Boots (Kenya), worked as lead research chemist for the International Centre for Insect Physiology and Ecology, had set up a state of the art pharmaceutical factory for the military

production arm NEC as far back as 1988 and later rebuilt the Rwanda government pharmaceutical factory of Butera which had been bombed out and restored it to full production. Mugalu's team started off with virtually nothing except a vision as they moved from Kibuli CID to an empty bushy plot that was allocated to them on Naguru hill.⁶⁹

By the time the decision to upgrade the forensics services was taken a few years back, what passed for scientific investigation at Kibuli constituted a small demoralized group with a couple of magnifying glasses and outdated photographic equipment. There was only one fingerprint expert and the country's only single ballistics expert had died a few years earlier. And so for some time, police had even lost the capacity to match a bullet recovered from a shooting victim to the gun that fired it! It was under such conditions that the pioneers got to work a few years ago. They designed the new forensics centre using entirely police in-house capabilities and no external consultants. The structure was constructed and got occupied. The first official recognition for their efforts came from the entire East African region. After inspecting all the major forensics facilities in the region, experts from the regional forces and beyond gave their verdict – Uganda's Naguru facility was best placed to become the East African Forensics Referral Centre – and the status was officially bestowed upon it. So the Naguru centre is now a regional asset and not just Uganda government facility. For some years in the past,

⁶⁹ Uganda Police takes leap into scientific investigations accessed on <https://www.upf.go.ug/uganda-police-takes-leap-scientific-investigations/>

the limited facility which was atrophying under CID was sufficient at that time in history when the country's population was small, crime rates low and the methods of commission not so sophisticated. But unfortunately, the period of neglect coincided with the population growth and the small 'identification bureau' with its demoralized staff simply could not keep pace.

On 28th January, 2021 the Forensic Laboratory Capabilities at Police headquarters, Naguru were commissioned.

Crime scene Management institutions in Uganda are challenged with equipment of the Forensics centre, inadequate resources, and the high, expensive as well as dynamic demands for resources, inadequate training of Ugandan scientists in modern forensic investigation. There are a number of persisting factors in Uganda that sometimes culminate into incorrect and misleading forensic examination results that are used in evidence in courts of law. Examples of such factors include corruption / undue influence, poor facilitation and time management, poor forensic facilities / equipment, incorrect methods of forensic evidence collection and examination. In Uganda there is no centralized body that regulates the functions of forensic experts.⁷⁰

This chapter addresses the connection between crime scenes management as an essential and fundamental step in establishing the facts in a criminal investigation and the delivery of justice in murder cases.

⁷⁰ Muduni Ronald, The role of Forensic Science in the administration of criminal justice in Uganda

Raymond Gieszl (1990)⁷¹ describes physical evidence as evidence that can be used to prove or disprove an element of a crime.⁷² According to the author, the criminal justice system requires an increased use of physical evidence and expert testimony regarding the information obtained from its examination. It is no longer sufficient for an officer to determine that a crime has been committed and to simply identify and arrest a suspect. The officer must be able to demonstrate the circumstances involved in the incident by utilizing physical evidence from the individuals involved and the crime scene to support the criminal charges. It is therefore, incumbent upon the professional police officer to make intelligent, effective use of the crime laboratory as an investigative aid. Accordingly, with the courts placing greater emphasis than ever on physical evidence, the chain of custody and the integrity of the evidence is being carefully examined and often challenged. The importance then of proper methods in collecting, marking and preserving evidence cannot be overemphasized. The manual therefore informs the investigator as to what the Crime Laboratory is equipped to do for him and outlines what is expected and required of him in the proper collection, preservation and submission of evidence for analysis to the laboratory.

⁷¹Raymond Gieszl (ed.); Physical Evidence Manual; (Phoenix Police Department Crime Detection Laboratory, 1990)

⁷² Raymond Gieszl (ed.) (1990); Physical Evidence Manual; Phoenix Police Department Crime Detection

According to H. J. Walls (2001)⁷³ Forensic science started as a hobby of a few scientists who liked to become mixed up in the proceedings of the police and “enjoyed the kind of problems this association brought them.” We do not know how forensic science originated and came together or how it came to be connected to the police investigations and court rulings.

Irakoze Chadia, Clarisse (2017)⁷⁴ analyses the impact of forensic evidence on the investigation and prosecution of murder cases under the criminal justice systems of Burundi and Uganda. In Burundi as in Uganda, many murders case have been recorded in the past years until today, and some perpetrators have been apprehended. Many of these crimes, however, remain unsolved because of lack of sufficient evidence on which to charge the perpetrators. The lack of scientific methods of investigation heading to over-reliance on testimonial evidence has raised genuine concerns over time. In that breath, this study undertook to evaluate the importance or role of forensic evidence in the investigation and prosecution of murders case. The main objective is to analyse and evaluate the role and the place of forensic evidence in the investigation and prosecution of murder in the criminal justice systems of Burundi and Uganda. The methodology used in this study was doctrinal research based on the library materials involving primary source and secondary source. The research identified some gaps in the procedural laws of both jurisdictions, in

⁷³ G. Manson (Bardsley), The importance of forensic evidence in criminal investigation. Forensic article, 2001

⁷⁴Irakoze Chadia, Clarisse (2017); The role of forensic evidence on murder cases under the criminal justice systems of Burundi and Uganda; Kamapala International University

particular of the absence of a proper way to carry out investigations on murder cases.

The study further establishes that in Burundi no method of forensic science is used in criminal investigations of murder and for this reasons the investigations are always done based on the traditional method of testimonies. In Uganda some forensic methods are used but the police staff in charge of conduct criminal investigation are not properly equipped in terms of training and other technical abilities relevant to examine different evidences collected on the crime scene. More so, there is lack of adequate equipment and other investigative tools. The research recommends that Burundi and Uganda, should improve the way of conducting criminal investigations using forensic science by investigating and prosecuting different crimes especially murder cases.

John⁷⁵ provides a foundation for people new to the digital forensics field. This book teaches you how to conduct examinations by discussing what digital forensics is, the methodologies used, key tactical concepts, and the tools needed to perform examinations. Details on digital forensics for computers, networks, cell phones, GPS, the cloud and the Internet are discussed. Also, learn how to collect evidence, document the scene, and how deleted data can be recovered. The new Second Edition provides a completely up-to-date real-world examples and all the key technologies used in digital forensics, as well as new coverage of network intrusion response, how hard drives are

⁷⁵John Sammons (2nd Edition, 2014); The Basics of Digital Forensics

organized, and electronic discovery. You'll also learn how to incorporate quality assurance into an investigation, how to prioritize evidence items to examine (triage), case processing, and what goes into making an expert witness. The Second Edition also features expanded resources and references, including online resources that keep you current, sample legal documents, and suggested further reading.

Stuart and Nordby (2003)⁷⁶ argued that due 'to the great importance of forensic science in the conviction of criminals, the basic ideas and concepts need to be taught to officers of local police departments so that evidence can be collected without contamination in order to keep criminals, from continuing to commit crimes that linger on forever in the minds of the victim's families and the nation's psyche. Throughout history, evidence has been used to convict criminals of the crimes that they have committed. Today's society has improved upon the methods of the past to bring about more precise and accurate techniques. These techniques are more commonly known as the field of forensic science'. Stuart and Nordby, argued that due 'to the great importance of forensic science in the conviction of criminals, the basic ideas and concepts need to be taught to officers of local police departments so that evidence can be collected without contamination in order to keep criminals, from continuing to commit crimes that linger on forever in the minds of the victim's families and the nation's psyche. Throughout history, evidence has been used to convict criminals of the crimes that they have committed.

⁷⁶ H. Stuart James, J. Jon Nordby, Forensic Science

Today's society has improved upon the methods of the past to bring about more precise and accurate techniques. These techniques are more commonly known as the field of forensic science'.⁷⁷

Forensic sciences are not often approached in academic areas. Lambert (2003), in his thesis, has based on an empirical study and explored the position in Michigan of forensic science as a subject in of law.⁷⁸

Munduni, Ronald (2008)⁷⁹ bases his study on the importance of forensic science towards the administration of criminal justice. When an accused person is proved guilty before the courts of law, he / she is subjected to punishment. Thus, there is need to ensure that it is only the guilty that are punished but not the innocent. Forensic evidence, although corroborative, plays a persuasive role in courts' decision making in cases where it is applicable. The main objective of the study, therefore, is to examine the effectiveness of the application of forensic evidence in the administration of criminal justice in Uganda.

The study noted that there is no way the application of forensic evidence in the administration of criminal justice can be effective when the respective

⁷⁷H. Stuart James, J. Jon Nordby, *Forensic Science: An Introduction to Scientific and Investigative*

Techniques, CRC press LLC, 2000 N.W Corporate Blvd., 2003, p. 1-9

⁷⁸ E. Lambert, T. Nerbonne, P.L. Watson, J. Buss, A. Clarke, N. Hogan, S. Barton, J. Lambert, *The Forensic*

⁷⁹ *Science Needs of Law Enforcement Applicants and Recruits: a survey of Michigan law enforcement agencies*. *Journal of Criminal Justice Education*, Vol. 14 No. 1, Spring, 2003

actors in the forensic field are deficient of forensic knowledge or have no local ways of enhancing the existing forensic knowledge they possess. The study further revealed that there are a number of persisting factors in Uganda that sometimes culminate into incorrect and misleading forensic examination results that are used in evidence in courts of law. Examples of such factors include corruption / undue influence, poor facilitation and time management, poor forensic facilities / equipment, incorrect methods of forensic evidence collection and examination. It was also found that the small number of forensic experts and the few forensic laboratories that are mostly located within Kampala do not provide a conducive environment for an effective application of forensic science in the administration of criminal justice in Uganda. Worse still, some forensic fields such as voice analysis, image and skeleton reconstruction are found to be non-functional in Uganda as they completely lack both the facilities and expertise.⁸⁰

It has also been observed that most of the few existing forensic laboratories are not strategically located to avail privacy to the examiners to conduct interference free, constructive analysis and examination of forensic samples. Most of them play a dual role: they are used as offices and laboratories. The study further revealed that in Uganda there is no centralized body that regulates the functions of forensic experts. Thus, the latter operate in an uncontrolled environment that in effect, is likely to prejudice the process

⁸⁰ Muduni Ronald; *The role of Forensic Science in the administration of criminal justice in Uganda*; (2008, Makerere University, Kampala-Uganda)

of administration of criminal justice. Last but not least, it was found that the government does not give sufficient support and recognition it deserves to upgrade the field of forensic science. The study recommends that government should establish forensic institutions so as to train a good number of forensic investigators and examiners. Their services should be decentralized to effectively cover the whole country. The government should also incorporate forensic science as a course unit within the University curriculum for both undergraduate and post graduate studies as a way to enhance forensic knowledge within the country.

It is also noted that there is need for the government to establish and revamp those non-functional forensic fields so as to avail the population cheaper local services instead of hiring foreign experts. The study also recommends that the government should give sufficient support to the field of forensic science and address the issue of facilitation of the forensic investigators and examiners so as to provide efficient services to the public. It is further recommended that the government should establish a regulatory body to oversee and regulate the functions of forensic science in Uganda. The government should further promote cross boarder collaboration to combat the emerging sophisticated information and communication crimes such as online fraud. In order to alienate the fear or likelihood of conflict of interest, the study recommends that the government needs to have forensic bodies independent of criminal investigation and prosecutorial bodies. Last but not least, expert opinion derived from experience should only be admitted by courts in exceptional cases where other more reliable scientific methods

are not applicable as experience does not have clear parameters that can be tested.

In the case of Uganda vs. Guster Nsubuga and others⁸¹

The four accused persons were indicted for unauthorized use and interception of computer services;⁸² Electronic Fraud;⁸³ unauthorized access to data;⁸⁴ Producing, selling, procuring, designing, being in possession of devices, Computers, Computer programs designed to overcome security measures for protection of data;¹⁸ unauthorized access to a customs computerized system;⁸⁵ as well as Fraudulent evasion of payment of duty.⁸⁶ At trial, Kayemba Isaac, manager forensic investigations at URA testified that he was handed various items for forensic imaging and analysis including a Lenovo laptop, a Samsung external hard disk, Samsung laptop and a Dell Laptop but the hard disk imaging for the Samsung laptop was done in South Africa for faster image acquisition which was not available locally. The case indicates challenges faced in use of forensic evidence in Ugandan jurisdiction. However, the case only applies for cyber crimes and not murder as the instant research is

⁸¹ [2013] UGHACD 12

⁸² C/S 19 of the Computer Misuse Act

⁸³ C/S 19 of the Computer Misuse Act

⁸⁴ C/S 12(2) and 20 of the
Computer Misuse Act

⁸⁵ C/S 12(3) and 20 of the
Computer Misuse Act

⁸⁶ C/S 191(1)(a) of the East African Community Customs
Management Act 2009

going to be focused. The case does not indicate the state of crime scene collection.

According to M.Flinker (2009)⁸⁷ the relationship between forensic science and the criminal investigation is very important. Klinker has explained that the relationship between forensic science and criminal investigation is like an employee- employer that is, “Forensic science is employed in order to investigate cases or questions that are of interest to the legal system and to help solve legal disputes⁸⁸

In the case of Mbatudde vs. Uganda⁸⁹

The accused had been charged with the murder of her lover who was burnt with concentrated Sulphuric acid. The Government analyst by then, Okum Stephen performed a chemical analysis of the blanket, bed sheets and a piece of burnt mattress and determined the cause of death as hypovolemic shock due to severe burn injuries. The Court considered physical exhibits taken from the deceased’s room found to contain concentrated sulphuric acid to establish that the deceased died of an unlawful death.

The case of Onok & Another vs. Omona⁹⁰

⁸⁷C/S 203(e) of the East African Community Customs Management Act 2009

⁸⁸ M. Klinker, Forensic science expertise for international criminal proceedings: an old problem, a new

⁸⁹ Criminal Appeal No.140 of 2004

⁹⁰ Civil Appeal No.32 of 2016

Stephen Mubiru J. noted that the Ugandan judicial system use the adversarial system of trial when resolving disputes and the system is based on the notion of two adversaries battling in an arena before an impartial 3rd party with emphasis on winning. Therefore, each party must ensure that they present the evidence weighty enough to secure their interests. This chapter will inform law makers on the weaknesses in the law that regulates the applicability of forensic science in investigating murder crimes and therefore pass regulations to close these gaps.

The chapter further invtigates the quality of law enforcement in collecting forensic evidence from crime scenes and therefore provide areas of improvement. Forensic science plays a very important role in the administration of criminal justice. Forensic evidence, although corroborative, plays a persuasive role in courts' decision making in cases where it is applicable. It has been noted that "The crime is becoming sophisticated and technology advancement keeps changing with time hence more training and investment in such machinery is needed"⁹¹

The chapter also informs the public of the essence in keeping the crime scene undisturbed, and therefore provide general knowledge on how to deal with crime scene evidence. When an accused person is proved guilty before the courts of law, he / she is subjected to punishment. Thus, there is need to ensure that it is only the guilty that are punished but not the innocent.

⁹¹ Dr. Flavian Zeija

There is certainly a need for increased use of physical evidence and expert testimony regarding content that has been gathered⁹² so as to connect criminal to the crime scene. This chapter helps to close the gaps in murder cases that arise out of wrong and inappropriate handling of forensic evidence. Major crimes are today committed with the application of modern science and so the police force has to keep pace with, overtake and stay ahead of the criminals in acquiring and applying modern scientific knowledge.

The chapter bases on the theories of criminology which include theories in strictosensu i.e. classical, positivistic, theories of social reaction and new criminological theories). In the other group, there are theories in victimology and penology, conceived (comprehended) as the criminological disciplines (along with the criminology in strictosensu, they constitute criminology in a broader sense).⁹³

I also depend on the theory of Criminalistics which focuses on recognition, identification, individualization, and evaluation of physical evidence by application of the natural sciences in law-science matters. Criminalistics is that profession and scientific discipline directed to the recognition, identification, individualization, and evaluation of physical evidence by application of the natural sciences in law-science matters.⁹⁴

⁹² Forensic Science and criminology 3rd edition

⁹³ John Duvaskiy; Writing a Dissertation in Business studies: A step by step assistance; <https://research-methodology.net/research-methods/data-analysis/qualitative-data-analysis/>

⁹⁴ Djordje Ignjatovic; Theories in criminology (2009); Pravni Fakultet Univerzitetu U Beogradu

LAWS GOVERNING CRIME SCENE INVESTIGATIONS IN UGANDA

In this chapter the researcher analyses the laws that regulate criminal investigations in Uganda starting with the international instruments that provide guidance on how to carry out criminal investigations; then the Ugandan laws that regulate criminal investigations. A crime scene involves the location of occurrence, any means of transport of a victim, any secondary locations (graves, dumpsites, etc).⁹⁵

I N T E R N A T I O N A L I N S T R U M E N T S

International law can be found in treaties, customary international law, general principles of law and binding resolutions of intergovernmental organizations, such as those of the UN Security Council adopted under Chapter VII of the UN Charter. The three most common categories of crimes that international tribunals are mandated to address are genocide, crimes against humanity and war crimes. All of these crimes entail violations of international law and are collectively referred to in this manual as international crimes. It is important to note that not every violation of international law will be investigated and prosecuted. International criminal courts and tribunals focus on prosecuting serious violations of international law. In principle, a state is only bound by those rules of international law to which it has consented. That means that a prohibition of a given crime is only applicable if and when the state concerned has accepted that prohibition as

⁹⁵ Raymond Gieszl (ed.) (1990); Physical Evidence Manual; Phoenix Police Department Crime Detection Laboratory

binding upon it. An exception to this rule is that the UN Security Council can impose upon states obligations to which they have not expressed their consent, when it acts under Chapter VII of the UN Charter. While this handbook concentrates on genocide, crimes against humanity and war crimes, it needs to be understood that international law also provides for other crimes. Some of these other crimes may also be relevant in the context in which you operate. Examples are individual acts of torture, enforced disappearances, and terrorist offences. However, the jurisdiction of most international criminal justice mechanisms extends only to genocide, crimes against humanity and war crimes.

While there are general principles related to crime scene investigations, local laws, rules and regulations govern many activities of the crime scene investigation and forensic process. They relate to issues such as how to obtain authority to enter the scene, to conduct the investigation, to handle evidence (e.g. the type of sealing procedure required) and to submit physical evidence to the forensic laboratory. They ultimately determine the admissibility of the evidence collected at the crime scene. Failure to comply with existing laws, rules and regulations can result in a situation where the evidence cannot be used in court. It is therefore of importance for personnel working at the scene to be aware of, and ensure proper compliance with, these rules. If adequate laws, regulations and rules to enable the forensic process do not exist, their establishment may be a matter of necessity.

DOMESTIC LAWS

Under the national laws, the starting point is the Constitution which is the Supreme law of the land with binding force over all authorities, organs, and bodies.⁹⁶ Also, the Constitution requires that any other law or Custom should be consistent with the same Constitution which literally implies that any analysis of the legal framework on any issue ought not to skip the Constitutional Provisions. The Constitution is also helpful in providing fundamental human rights and freedoms⁹⁷

GENERAL CRIMINAL LAW AND PROCEDURE

Crime in Uganda is mainly regulated by the Penal Code Act⁹⁸ which provides for the substantive penal law and the criminal procedure is provided by several Acts such as the Criminal Procedure Code Act,⁹⁹ the trial on indictments Act,¹⁰⁰ the Police Act,¹⁰¹ and the Evidence Act.¹⁰²

The Penal Code Act is interpreted in accordance with the principles of legal interpretation obtaining in England, and expressions used in it are presumed, so far as is consistent with their context, and except as may be

⁹⁶ Article 2 Constitution of the Republic of Uganda 1995 as amended

⁹⁷ Chapter 4 of the Constitution of the Republic of Uganda 1995

⁹⁸ Chapter 120 of the Laws of Uganda

⁹⁹ Chapter 116 of the Laws of Uganda

¹⁰⁰ Chapter 23 of the Laws of Uganda

¹⁰¹ Chapter 303 of the Laws of Uganda

¹⁰² Chapter 6 of the Laws of Uganda

otherwise expressly provided, to be used with the meaning attaching to them in English criminal law and are construed in accordance therewith.¹⁰³

The Evidence Act applies to all judicial proceedings in or before the Supreme Court, the Court of Appeal, the High Court and all courts established under the Magistrates Courts Act, but not to affidavits presented to any court or officer nor to proceedings before an arbitrator.¹⁰⁴ The Act defines “evidence” as any alleged matter of fact, the truth of which is submitted to investigation, is proved or disproved and includes statements by accused persons, admissions, judicial notice, presumptions of law, and ocular observation by the court in its judicial capacity.

The Criminal Procedure Code Act makes provision for the procedure to be followed in criminal cases. The Act generally provides for the procedure to be followed when arresting a person;¹⁰⁵ search of a place sought to be arrested;¹⁰⁶

The Police Act provides inter-alia for the structure, organisation and functions of the police force, a police disciplinary code of conduct, a Police Welfare Fund, a police tender board. According to the Police Act, which is subject to the Constitution, the functions of the force include to protect the life, property and other rights of the individual;¹⁰⁷ to maintain security

¹⁰³ Section 1 of the Penal Code Act Chapter 120 of the Laws of Uganda

¹⁰⁴ Section 1 of the Evidence Act Chapter 6 of the Laws of Uganda

¹⁰⁵ Section 2 of the Criminal Procedure Code Act Chapter 116 of the Laws of Uganda

¹⁰⁶ Section 3 of the Criminal Procedure Code Act Chapter 116 of the Laws of Uganda

¹⁰⁷ Section 4 (1)(a) of the Police Act Chapter 303 of the Laws of Uganda

within Uganda;¹⁰⁸ to enforce the laws of Uganda;¹⁰⁹ to ensure public safety and order;¹¹⁰ to prevent and detect crime in the society;¹¹¹ and to perform the services of a military force;¹¹² and to co-operate with civilian authorities and other security organs established under the Constitution and with the population generally.¹¹³

The Trial on Indictments Act consolidates the law relating to the trial of criminal cases on indictment before the High Court

STANDARD OF PROOF IN CRIMINAL CASES

In all criminal cases, the prosecution has a duty to prove all the ingredients of the offence beyond reasonable doubt. In every criminal trial a conviction can only be based on the weight of the actual evidence adduced and it is dangerous and inadvisable for a trial Judge to put forward a theory not canvassed in evidence or in counsels' speeches.¹¹⁴ 'The prosecution must prove, beyond all reasonable doubt, that the accused intended to (kill or) do serious bodily harm to Mrs. Booth, the mother of the deceased girls. If you are satisfied that when the accused set fire to the house she knew that it was

¹⁰⁸ Section 4 (1)(b) of the Police Act Chapter 303 of the Laws of Uganda

¹⁰⁹ Section 4 (1)(c) of the Police Act Chapter 303 of the Laws of Uganda

¹¹⁰ Section 4 (1)(d) of the Police Act Chapter 303 of the Laws of Uganda

¹¹¹ Section 4 (1)(e) of the Police Act Chapter 303 of the Laws of Uganda

¹¹² Section 4 (1)(f) of the Police Act Chapter 303 of the Laws of Uganda

¹¹³ Section 4 (1)(f)(a) of the Police Act Chapter 303 of the Laws of Uganda

¹¹⁴ Okethi Okale & Ors. Vs. Republic (1965) EA 554

highly probable that this would cause (death or) serious bodily harm, then the prosecution will have established the necessary intent. It matters not if her motive was, as she says, to frighten Mrs. Booth.’

CRIME SCENE EVIDENCE

The Locard’s exchange principle states that it is impossible for criminals to escape a crime scene.¹¹⁵ Physical evidence may be corroborative to confirm or support the theory of crime or it may be circumstantial to indirectly infer a particular conclusion. Latent print examination involves the detection, collection, and comparison of finger prints with known individuals.

CIRCUMSTANTIAL EVIDENCE

Circumstantial evidence is evidence which although not directly establishing the existence of the facts required to be proved, is admissible as making the facts in issue probable by reason of its connection with or in relation to them. It is evidence, at times regarded to be of higher probative value than direct evidence which may be perjured or mistaken. Usually when the case for the prosecution is based on circumstantial evidence, and there is need for the prosecution to disprove the alibi raised by the accused person, physical evidence will be useful in connecting the accused to the crime scene.

In the case of *Simmon Musoke Vs. R*,¹¹⁶

The Court of Appeal for East Africa held that in a case depending exclusively upon circumstantial evidence, the Court must, before deciding upon

¹¹⁵ in the physical world, where perpetrators enter or leave a crime scene, they leave something or take something with them”-Edmond Locard (1877-1966)

¹¹⁶ (1958) EA 715 at page 718H

conviction, find that the inculpatory facts are incompatible with the innocence of the accused, and incapable of explanation upon any other reasonable hypothesis than that of guilt”.

EXPERT EVIDENCE

In the case of *Mutesasira Musoke vs. Uganda*¹¹⁷ the Supreme Court held that expert evidence (such as evidence by forensic experts) must be carefully scrutinized and not be taken as unquestionable truth.

INSTITUTIONAL FRAMEWORK

The Uganda Police Force Directorate of Forensic Services

The Directorate of Forensic Services (DFS) is tasked with the application of scientific techniques in prevention, investigation and detection of crime to support administration of justice. This includes; Provision of scientific evidence to link suspects to a specific criminal act; Identify offenders and criminals using fingerprints and photographs; Keep a comprehensive and detailed record of criminals; Examine questioned documents such as land titles, legal tender, last wills and testimonies; Analyze electronic tools and equipment used in the commission of cyber-crimes; Analyze and provide evidence in cases involving guns and explosives in an effort to combat gun crime and terrorist activities.

¹¹⁷ (Supreme Court Criminal Appeal No. 17 of 2009)

The Courts of Judicature

The Supreme Court is the highest Court in Uganda and is the final court of Appeal. The Supreme Court only decides cases on appeal from lower courts save for presidential election petitions, where the Supreme Court has original jurisdiction, which means that any aggrieved candidate in a presidential election has to petition the Supreme Court directly. The decisions of the Supreme Court form precedents which all lower courts are required to follow. The Supreme Court bench is constituted by the Chief Justice and not less than six Justices. Five Justices are sufficient to hear most cases, but when hearing appeals from decisions of the Court of Appeal, a full bench of seven justices has to be present. The decisions of the Supreme Court form precedents that all lower courts are required to follow.

The Court Appeal was established by the 1995 Constitution. It is an intermediary between the Supreme Court and the High Court and has appellate jurisdiction over the High Court. It is not a Court of first instance and has no original jurisdiction, except when it sits as a Constitutional Court to hear constitutional cases. The Court of Appeal consists of: The Deputy Chief Justice and such number of Justices of Appeal not being less than seven as Parliament may by law prescribe. Cases coming before the Court of Appeal may be decided by a single Justice. Any person dissatisfied with the decision of a single Justice of Appeal is, however, entitled to have the matter determined by a bench of three Justices of Appeal, which may confirm, vary or reverse the decision. Cases decided by the Court of Appeal can be appealed to the Supreme Court, but the Court of Appeal is the final court in

election petitions filed after Parliamentary elections or elections provided for by the Local Government Act. When deciding cases as a Constitutional Court it sits with a bench of five judges.

The High Court of Uganda is the third court of record in order of hierarchy and has unlimited original jurisdiction, which means that it can try any case of any value or crime of any magnitude. Appeals from all Magistrates Courts go to the High Court. The High Court is headed by the Principal Judge who is responsible for the administration of the court and has supervisory powers over Magistrate's courts. The High Court has five Divisions: The Civil Division, the Commercial Division, the Family Division, the Land Division and the Criminal Division. Subordinate Courts include the Chief Magistrates Court, Industrial Court Magistrates Grade I and II Local Council Courts levels 3-1 (sub county, parish, and village).

In Uganda v Uwera Nsenga¹¹⁸

Gaswaga J observed; Only the DPP, and nobody else, enjoys the powers to decide what the charges in each file forwarded to him or should be. Although the police may advise on the possible charges while forwarding the police not binding on the DPP

¹¹⁸ (Criminal Session Case-2013/312) [2014] UGHCCRD 43

CHALLENGES FACED IN CRIME SCENE INVESTIGATIONS AND PRESENTATION OF FORENSIC EVIDENCE IN UGANDAN COURTS.

The researcher identifies the challenges that are faced in the administration of crime scene investigations in Uganda and presentation of the evidence in Uganda. The most important question in this chapter is why the forensic evidence presented by the prosecution in the Courts of Law don't secure convictions of the suspects.

ECONOMIC CHALLENGES

The forensic services and investigations in Uganda are impeded by limited resources. It has been reported that the State Minister for Internal Affairs, Mario Obiga Kania, meeting MPs on Parliament's Public Accounts Committee has lamented that forensics scientists are leaving the country due to high global demand for their skills. Obiga Kania was on Thursday 31, who had invited him as the political head overseeing the Directorate of Government Analytical Laboratories. The MPs were concerned about issues relating to underfunding, understaffing and high turnover at the directorate.

Obiga Kania revealed that owing to low salaries and failure by the government to enhance pay, forensics experts have left for greener pastures. "We have observed that the phased salary enhancement of scientists across public service has not been fully implemented and this affects our ability to retain our scientists," he added. The MPs, led by Masaka Municipality MP,

Mathias Mpuuga also noted that the regional laboratories in Mbale, Mbarara, Moroto and Gulu are grossly understaffed and this affects laboratory analysis.

The legislators were disturbed by the revelation that two of the regional laboratories in mbarara and Moroto are manned by only one person each at the level of office attendant; the Mbale lab has two personnel. Mr Kepher Kuchana, the Head of the Directorate of Government Analytical Laboratories admitted to the gross understaffing noting that they do not have enough people to analyse the exhibit samples that they receive. “We do not have scientists in Mbarara, Moroto and Mbale so our office attendant can only manage to receive and store samples,” he said.

Hon. Mathias Mpuuga was particularly irked by the potential contamination of exhibits owing to poor handling by office attendants. “How sure are we that these office attendants are conversant with handling these exhibits without compromising them?” he asked. But Kuchana said, “samples and exhibits are handled by Police at the scene of crime as well as CID officers who have received the necessary training.” Kuchana noted that the Directorate needs Ushs1.2 billion to fill the approved human resource structure adding that out of the approved structure of 124 positions, only 50 are filled. He also stated that the Ministry of Internal Affairs had in 2017 written to the Ministry of Public Service requesting for Ushs8.3 billion to enhance salaries so as to motivate staff at the Directorate but to date, only Ushs572 million had been provided. Mpuuga further noted that before any salary enhancements are done the Directorate should ensure that proper recruitment is done. He demanded for a recruitment plan from the directorate. The Director of Human Resource in the Ministry of Internal Affairs, Proscovia Babirye, told

the committee that the directorate had a three-year recruitment plan to fill all positions if Ushs300million is availed every year.¹¹⁹

S O C I A L C H A L L E N G E S

Lack of improved skills and training on forensic skills: This can be witnessed in the case of *Uganda vs. Akbar Godi*¹²⁰ where the trial judge considered the evidence on soil analysis, the DNA yet the expert witness had confirmed that he had no training in soil examination. Indeed this aspect was challenged by the appellant (albeit unsuccessfully) in the Supreme Court case.¹²¹

The preliminary investigation is poor or insufficient, the rest of the procedure is compromised. The manifestation of truth often leads to the presence of evidence whose collection requires rapid intervention, which can only be done during the police investigation.

Forensic expertise consists of special skills in providing scientific information in a form in which it can assist legal decision making. Most practice is routine and uncontroversial, and this permits the construction of knowledge about individual cases on a day-to-day basis. Where difficulties arise, forensic experts do not formulate ‘general problems’ but rather seek to negotiate a specific solution, one which is pragmatically appropriate to the case in hand. The hard-pressed forensic services can therefore move on from one case to the next while providing what the courts require.

¹¹⁹ Sydona Nasse; Forensic scientists leaving Uganda due to poor pay – Minister Kania; <https://www.pmldaily.com/news/2019/11/forensic-scientists-leaving-uganda-due-to-poor-pay-minister-kania.html>

¹²⁰ Akbar Godi Vs. Uganda Criminal Appeal No. 3 of 2013

¹²¹ Criminal Session Case No.0257 of 2010

In stressing that controversy over forensic evidence is the exception, forensic experts imply that most scientific facts translate very easily into legal facts. Legal and scientific institutions share a strong empiricist ethos, valuing knowledge in the form of precise observational statements. This same ethos assumes that an accurate observational statement is transferable from one social setting to another or from the social purpose to another, and thus that the use of scientific facts as legal facts should be unproblematic. As a few much-discussed cases show clearly, this is not so. Science and law formulate factual knowledge for different-social purposes; the purpose of science is knowledge of nature that of the criminal law is justice. It would require a jurisprudence of a very special kind (such as one equating justice and utility, which most people would not accept), to lead to an expectation that the purposes of science and of law should always coincide. Thus, we argue, there will always be cases in which the courts take decisions in a way, which, from the scientist's viewpoint, distorts scientific knowledge. Since the law has priority over science, historically and politically, this may place the scientist in a most uncomfortable position.

Forensic experts, however, are occupationally adept at 'serving' the courts. This explains why, despite different purposes, legal decision-making can straightforwardly incorporate forensic science most of the time. This leaves forensic scientists and pathologists with the social and psychological difficulty of balancing a sense of self-identity as scientist or doctor and an occupational identity as servant of the legal administration. Sometimes this balance is upset, through a scientist or pathologist not upholding the standards of science (an element in Preece's trial), or through a court

pursuing its ends without sufficient regard for separate scientific values (an element in Arthur's trial).

We should not regard cases where there is controversy concerning forensic evidence in terms of 'failure'. From a technocratic viewpoint, which assumes that even legal decision making should depend on expert assessment of all the circumstances of a case, it must be 'failure' where the law and science are at odds. From a different political viewpoint, it is quite proper sometimes to deny scientific knowledge a decisive place. The political difference here becomes explicit when a court (as in obscenity cases) has to decide whether it is right for the purposes of the court to hear expert evidence. The court may wish to decide whether there really is expert knowledge in a particular area, or, even if there is, whether the issue for the jury is one, which requires its own lay understanding rather than expert knowledge. The persistence of the court's right to decide what constitutes relevant expertise is an important sense in which lay as opposed to expert viewpoints retain authority. Mapping how in fact the courts do draw boundaries around expertise would provide valuable sociological information about the relations between technical expertise and public opinion. For example, the courts have withdrawn the authority of psychology experts in obscenity cases.

COMPARATIVE ANALYSIS OF CRIME SCENE INVESTIGATIONS IN OTHER JURISDICTIONS

Suggested Standard procedure:

Secure and clear the scene - Access to the scene should be restricted to essential personnel required for lifesaving measures (paramedics) or crime scene processing (detectives, medical examiners). All others, including

officers and supervisors not assigned a specific function, must be excluded if possible to avoid contamination or alteration of the scene or the loss of valuable information. No items of evidence, including firearms, should be handled until they can be evaluated. If a suspect is already in custody, it is of paramount importance that he be kept well clear of the crime scene. Systematic Search of Scene - One, or at the most two officers should collect all the evidence. Any other officers assisting in the search merely point out potential evidence for subsequent collection by the officer with that responsibility. Notes should be taken as to the date and time, condition, position, and description of each item collected. Photographs - Any necessary photographs should be taken prior to removal of possible evidence. Photographs must accurately reflect the scene or specific evidence.

The study noted that there is no way the application of forensic evidence in the administration of criminal justice can be effective when the respective actors in the forensic field are deficient of forensic knowledge or have no local ways of enhancing the existing forensic knowledge they possess. The study further revealed that there are a number of persisting factors in Uganda that sometimes culminate into incorrect and misleading forensic examination results that are used in evidence in courts of law. Examples of such factors include corruption / undue influence, poor facilitation and time management, poor forensic facilities / equipment, incorrect methods of forensic evidence collection and examination. It was also found that the small number of forensic experts and the few forensic laboratories that are mostly located within Kampala do not provide a conducive environment for an effective application of forensic science in the administration of criminal justice in Uganda. Worse still, some forensic fields such as voice analysis, image and skeleton reconstruction are found to

be non-functional in Uganda as they completely lack both the facilities and expertise.

The study noted that there is need for the government to establish and revamp those non-functional forensic fields so as to avail the population cheaper local services instead of hiring foreign experts. The study also recommends that the government should give sufficient support to the field of forensic science and address the issue of facilitation of the forensic investigators and examiners so as to provide efficient services to the public. It is further recommended that the government should establish a regulatory body to oversee and regulate the functions of forensic science in Uganda. The government should further promote cross boarder collaboration to combat the emerging sophisticated information and communication crimes such as online fraud. In order to alienate the fear or likelihood of conflict of interest, the study recommends that the government needs to have forensic bodies independent of criminal investigation and prosecutorial bodies. Last but not least, expert opinion derived from experience should only be admitted by courts in exceptional cases where other more reliable scientific methods are not applicable as experience does not have clear parameters that can be tested.

UNITED STATES OF AMERICA

If an object can be marked, by all means mark it; and when its size permits, mark it in such a way that it becomes unique to the particular case. As an example, your initials, serial number and a DR number can easily be written on a hand-rolled cigarette with a fiber or ball point pen. Remember, if in court a year or more later, you cannot relate the exhibit to this particular offense being tried; it will not be admitted into evidence.

Evidence tags and adhesive labels may also be used to mark evidence when appropriate to use. Items whose very nature or size precludes their being marked should be placed in a small vial or envelope, sealed, and the vial or envelope marked accordingly.

The study further discovered that most of the few existing forensic laboratories are not strategically located to avail privacy to the examiners to conduct interference free, constructive analysis and examination of forensic samples. Most of them play a dual role: they are used as offices and laboratories. The study further revealed that in Uganda there is no centralized body that regulates the functions of forensic experts. Thus, the latter operate in an uncontrolled environment that in effect, is likely to prejudice the process of administration of criminal justice. Last but not least, it was found that the government does not give sufficient support and recognition it deserves to upgrade the field of forensic science. The study recommends that government should establish forensic institutions so as to train a good number of forensic investigators and examiners. Their services should be decentralized to effectively cover the whole country. The government should also incorporate forensic science as a course unit within the University curriculum for both undergraduate and post graduate studies as a way to enhance forensic knowledge within the country.

Marking containers - Appropriate containers ranging from large plastic bags to small pill vials and coin envelopes should be chosen for the packaging of any physical evidence collected. The containers must not allow loss or contamination of the evidence. Once the evidence is in a suitable container, it should be sealed and the seal initialed and dated. The information written on the envelope or container should include: A. DR number B. Date and time collected C. Location found D. Suspect's name E. Officer's name and

SIN F. Charges G. Disposition of the evidence H. Date and time of transfer
Multiple items should be itemized and the item numbers placed on the envelope or container. Further suggestions for evidence collection and packaging will be offered in subsequent portions of this manual.

FRANCE

When a crime is discovered, security forces must be notified by calling "17". In the countryside, or in a city of less than 20,000 inhabitants, the call arrives at the gendarmerie. In a more important city, it is at the police station of the national police. But under no circumstances to the municipal police. An investigator moves as quickly as possible to the scene, but the latter often arrives after the firemen. Indeed, if there is a chance to save the victim, it must be seized.¹²² The investigators alert the technicians of the scientific police. They are called ICTs (Criminal Identification Technicians) in the gendarmerie and GSI (Gestionnaire descène d'infractions) in the National Police. In any case, their mission is to collect the traces, fingerprints, and objects left by the delinquents. TIC and GSI are not only involved in the homicides, but also in suicides, bank robberies, burglaries, and so on.

If the investigation needs further investigation, the prosecutor appoints an investigating judge. This magistrate with extensive powers brings together all the elements necessary to establish the truth. He is instructed, as one says, "to charge and discharge," that is, to prove the innocence and guilt of a suspect. It may seek the assistance of experts, including experts from the police of the forensic police, as well as any other expert registered with the courts.

¹²² J., P. Brodeur, G., Ouellet, The criminal investigation, An article in the journal *Criminology*, Volume 38, Numéro 2, Automne, 2005, p. 39–64

When the investigating judge has finished, the trial can start (it can also decide that the suspect is not to be tried: it is the non-place). For a crime, the trial takes place in court of assizes before three professional judges and a popular jury composed of nine citizens drawn by lot. The experts of the forensic police may be called to testify at the trial.

Inadequate enabling laws, the Penal Code Act of Burundi is not modern enough to meet the challenges of investigations in this era. The lack of skilled personnel to carry out the analysis of fingerprints as and when they are received in the forensic laboratory has been cited. Lack of awareness by the public, police personnel and judicial officials of the values attached to forensic evidence.

BURUNDI

Overwhelming majority of the evidence allowing the demonstration of the truth are proofs by word reported: testimonies, confessions, denunciations. The strictly material evidence is most often absent from the files: no fingerprint, no autopsy, no DNA sampling on the victim, no ballistics report, sometimes only the murder weapon is seized:

Two consequences result from this fact:

First, the risk of instrumentalization of the means of proof and influence of the actors judicial; Second, the difficult burden placed on witnesses: whether they are prosecution or defense witnesses, their story may suffice to convict an individual or, on the contrary, to exculpate him. The pressure on the witnesses is strong and an ambiguous relationship develops between the witnesses and the accused, the victims, the community and the institutions. The absence of alternative evidence to the testimony also nourishes the desire for revenge on the part of the condemned: without conclusive testimony, no condemnation.

The responsibility for the conviction can thus be embodied in the person of the prosecution witness.

There are no legal texts that clearly regulate the evidence that must be admitted by the courts, the only legal text available to the country for the admissibility of the evidence is the Criminal Procedure. There is not a special body charged with conducting criminal investigations such as the CID of Uganda, which means that a police unit that is around the place where the murder was committed, it is the one who will be responsible for conducting the investigation. The Burundian national police are not well trained and does not have adequate materials to deal with the growing crime from day to day. The country does not use any forensic science method in its criminal investigations and has no Forensic Science experts. Furthermore, it doesn't have any criminalistics laboratory. In the country's universities, there are no courses given on forensic science sciences.

TANZANIA

A critical element in the investigation of any crime is the collection of physical evidence. Eyewitness accounts are not always reliable and many times the victims, as well as the suspects, give biased accounts of what occurred. Frequently, there is only one survivor and one story available. It is the physical evidence which is used to resolve any conflicts. The prosecutors often insist that the investigators have physical evidence supporting the charges and linking the suspect to the victim or crime scene before they will file the case. The trial courts are requiring that the case be supported by physical evidence which has at its foundation scientific principles relating to provable facts. If all the physical evidence has not been collected or preserved properly, it has been found to be reversible error and convictions have been overturned by the appellate courts. All these factors make it

essential that the crime scene be completely and properly investigated and that all the physical evidence be collected, evaluated and preserved. The majority of crime scene processing is the responsibility of the officers and detectives. The Latent Print section of the laboratory provides fingerprint and photographic support while the criminalists will scientifically examine the physical evidence collected. In certain circumstances, the criminalists are available on call-out for active crime scene support. The officers are responsible for the documentation, collection and preservation of the physical evidence. The laboratory staff will assist and provide technical support.

K E N Y A

Kenya has got a Crime Scene Investigation Services which is one of the sections within Forensic Investigation unit at the Directorate of Criminal Investigations department. It offers reliable crime scene support services using scientific know-how to other forensic units and general investigators. The Headquarter is based at Mazingira house along Kiambu road, it has sub-sections across the country with a proposed expansion to cover the entire country in future. It's roles and functions of crime scene investigation services include: General crime scene management; Collection of trace evidence from crime scenes, fingerprints, footmarks, body fluid, tool marks, paint etc.; Trap laying in conjunction with EACC; Restoration and verification of serial numbers of motor vehicles, tools, plastics and guns; Analysis of crime scene patterns e.g. Glass, Blood spatter, Crime scene marks, and Burning patterns; Crime scene documentation e.g. Photography, Videography, Sketch plan and note taking; Training and giving lectures on matters relating to forensic investigations; Presentation of crime reports and findings in courts of law; Explosive ordinance disposal and post blast investigations; Research on new

techniques and methodologies applicable to crime scene investigation duties; Exhibits/ evidence recovery, packaging and labeling.

WAY FORWARD

In this chapter, the researcher presents the extent of crime scene management efforts made so far. The Directorate of Forensic Services (DFS) is tasked with the application of scientific techniques in prevention, investigation and detection of crime to support administration of justice. This includes; Provision of scientific evidence to link suspects to a specific criminal act, Identify offenders and criminals using fingerprints and photographs, Keep a comprehensive and detailed record of criminals, Examine questioned documents such as land titles, legal tender, last wills and testimonies, Analyze electronic tools and equipment used in the commission of cyber-crimes, and to Analyze and provide evidence in cases involving guns and explosives in an effort to combat gun crime and terrorist activities.

In the period between 2019 and 2020, the Uganda Police Force spent 345,728,240 to carry out 7447 medical examinations of SGBV cases and 2911 postmortems, instead of 450,000,000 that had been budgeted for. The Uganda police spent 185,000,000 on improved recovery of evidence in 30% of reported SGBV cases. This however was out of 285,000,000 that had been budgeted for. The UPF spent 135,000,000 in procuring 35 scene of crime (SOCO) kits instead of the 50 kits that had been budgeted for. The UPF spent 45,000,000 to train 39 dog handlers instead of the 50 dog handlers that had been budgeted for at the same price. 300 millions were spent by the Uganda Police Force on 30 customized motorcycles procured for SOCOs.¹²³

¹²³ Annual JLOS Report 2020

CASES WHERE FORENSIC AND PHYSICAL EVIDENCE WAS USED IN UGANDA

Case law in the field of fingerprints has no well-established foundation in Ugandan. It is clear that such evidence as fingerprint or foot impressions is regarded to be circumstantial in nature. The most popular case in this field is that of the murder of an American national one Cecilia Marie, Goetz in 1998 by Richard Arinaitwe (unreported). In this case finger print impressions played a very important role in reaching a logical legal conclusion in the matter.

In the case of Akbar Hussein Godi, Nineteen-year-old Rehema Ceasar was shot dead on the evening of December 4, 2008 at Lukojjo village in Mukono District. She had apparently gone out for dinner with a person whose identity she had not disclosed. Nobody saw the person who shot and killed her. Nobody apparently saw the person she had gone out with for dinner. Her husband, Akbar Hussein Godi, then a 25-year-old Member of Parliament for Arua Municipality and a lawyer by profession, was charged and convicted of her murder. The prosecution presented and court used what is known as circumstantial evidence in addition to forensic evidence to convict Godi.

In Uganda vs Dr Aggrey kiyingi and 2 others¹²⁴ D/Sgt Karugaba and D/IP Katungi were the two officers who were at the center of the investigations. They went to the scene and recovered some exhibits, some of which were submitted for forensic examinations. Their evidence was that the death of the

¹²⁴ criminal session case no. 0030 of 2006

deceased had been planned by Dr Kiyingi coordinated by Berwanaho (A2) and executed by the late Atwine who was a brother of Berwanaho (A2). The gun which was used was brought by Bob Mugisha (A3).

That gun was recovered near the scene. Its butt had been cut off and its serial number removed. The gun and ammunitions recovered at the scene were taken to Nairobi by D/SP Aisu (PW15), for forensic examinations. Mr. Johnston Musoki Mwongela (PW9), firearms expert from CID headquarters Nairobi, with great skills, managed to restore the serial number, which the assailants had erased. He also confirmed that the cartridges which were recovered from the scene had been fired from the said gun. The accused were accordingly acquitted and set free basing on the evidence of forensics.

In the case of Godi v Uganda¹²⁵

The evidence of Ochom J. Mike, the Government Analyst, was used to place the appellant at the scene of crime because his report in effect showed that the soil found on the sole of the exhibited shoe matched both mineral and chemistry profile of the soil got from the scene of crime and that both the trial Court and the Court of Appeal wrongly assumed that size 39 and size 42 are in the same range. Court also considered the evidence of the ballistic expert.

The States should require that all forensic science laboratory analysts receive proper training and certification: it is true that Uganda has some forensic laboratories, but these laboratories are almost un-equipped, there are not enough materials, and even those who work there have not received adequate training. So the Ugandan state should review the state of these laboratories, equip them with necessary materials.

¹²⁵ (Criminal Appeal-2013/3) [2015] UGSC 17

The issue of the number of fingerprint experts in Uganda police: in this area, there is much need to ensure that more of the experts in this area are trained to ensure effective performance of duties in the interest of criminal justice in the country.

The increase of forensics scientists: The findings revealed that in Uganda there is a problem of the fewest of forensic scientists, and even the latter have not received sufficient training. the state should take care of these people who have the capacity and the education necessary to be forensics scientists, send them abroad, so that they can be well formed for fear that one day the country will be found that he has no forensic scientist capable of carrying out an investigation.

Forensic sciences should be approached in academic areas: Uganda has a few universities which teach subjects on forensic sciences, but these subjects are not well given because students are only entitled to theories only. do not receive opportunities to go on field to practice what they have studied. which leads the researcher to recommend to the Ugandan State to improve the conditions under which these materials are given.

Training and adequate equipment: as the study mentioned above, Burundi and Uganda have this common problem, their agents receive little training and doesn't have enough equipment. So, the researcher recommended to those states that the police officers and the investigators can be well trained and that if necessary that they can send some of them abroad in order to obtain a better formation, and that, moreover, a good equipment is available to them.

It has also been found that there is lack of scientific research to confirm the validity and reliability of forensic sciences disciplines and to establish quantifiable measures of uncertainty in the conclusions of forensic analyzes still a big challenge; that there is absence of new methods of forensic science

that can be applied in different cases of murder and which can help to resolve them; that there is inability of forensic experts to use standard terminology to report and testify to the results of forensic investigations; and that there is lack of rigorous and mandatory certification requirements for practitioners; the forensic evidence plays a major role in murder investigation and prosecution. When a person is charged with a crime, the prosecution and the defense call upon different witnesses to testify to the guilt or innocence of the accused person. One of the most important actors in all this testimony is often not a person: it is forensic evidence.¹²⁶

¹²⁶ C. Matthew Bangerter, *The Importance of Forensic Evidence in court*, 2016. From <http://www.Bangerterlaw.com>, accessed on 27th, October, 2020

CHAPTER EIGHTEEN



DYING DECLARATION VERSUS HEAR SAY RULE AS AN EXCEPTION IN FORENSIC SCIENCE

Hearsay evidence is a question of reliability. Hearsay evidence is *inadmissible*. In Uganda, the confession has to be written and signed by a magistrate or superintendent of police. According to common law hearsay evidence directed to court by a witness requires establishing the truth of what was asserted.

Hearsay evidence must be of oral origin. That statement must have been made by that person who is not before court. The purpose of that statement must be to prove what was said.

In the case Chander Sakera v R [1937] AC 220 the court said:

“...statement is only hearsay if it’s introduced for the purpose of establishing the truth of an earlier statement. this is because in some places the issue may not be whether the statement is true but whetherin such cases repeating what was quoted will not amount to hearsay...”

Supra Minium v DPP (1956) 1 WLR 965

Assertions by a third party are inadmissible this is the rule against hearsay evidence.

R v Gibson (1887) 18 QB 537

It is upon parties to raise an objection to plead that it be admitted.

Sparks v R (1964) AC 964

R v Turner (1957) 65 Cr. App R 78

Why does court reject hearsay evidence?

- The original maker is not in court to be cross examined to establish the veracity of the statement.
- Likelihood of distortion.
- It is not possible to establish the meaning of the words since the original maker may have used them in a different context.
- There is no opportunity to judge the demeanor of the original maker of the statement.
- Admission of the evidence is likely to lead to protracted litigation because there might be no end to admitting to what was said or not.
- May impede the efficiency of investigation because of widening the scope.
- Tendency to surprise the opponent.

EXCEPTIONS TO THE EVIDENCE RULE

Statements, written or verbal, of relevant facts made by a person who is dead, or who cannot be found, or who has become incapable of giving evidence, or whose attendance cannot be procured without an amount of delay or expense which in the circumstances of the case appears to the court unreasonable, are themselves relevant facts in the circumstances under **sec.30 (a-h)**.

According to 30 (a) such statement is relevant when made by a person as to cause his or her death or as to any of the circumstances of the transaction

resulting in his death in cases in which the causes of death of the person comes into question and the statements are relevant whether the maker made them under expectation of death or not and irrespective of the proceedings in which the cause of death comes into question. This is the exception that provides for **dying declarations**.

A dying declaration

This is a statement uttered by a since deceased person the purpose of which is to establish the cause of death of the maker. Dying declarations were admitted by the common law on the basis of the belief that *'man shall not meet his maker with a lie in his mouth.'*

Under other common law jurisdictions, dying declaration is only admissible in the inquiry of manslaughter but for Uganda it is admissible under any of the circumstances where the death of the person comes into question.

Under common law a dying declaration is only admissible if the deceased was under a hopeless expectation of death. However, under our evidence act it is admissible even if the deceased had a chance of living. It is immaterial whether the maker was under expectation of death or not.

In the case R v Woodr....

“..A dying declaration to be valid, the deceased must have lost hope of living that if he at least had a chance however remote, then it could not be admitted. According to court, this was intended to ensure that the moral and spiritual compulsion that had taken over the person and that in the circumstances they could not tell lies...”

WHO MAKES A DYING DECLARATION?

Any person who can give evidence in court can.

Uganda v Tomasi Omukono [1977] HCB 61 states the elements of a dying declaration i.e

- Death qualifies it to be a dying declaration
- The statement must be complete.

Kalisiti Ssebugwawo v Uganda (1990-91) KALR 116,

Waugh v R [1956] AC 203

Daki v R [1960] EA 34

- Corroboration; it must independent of the evidence that one wants to corroborate. It must not only confirm the commission of the offence but also link the accused to the commission of the offence

STATEMENTS MADE IN THE ORDINARY COURSE OF BUSINESS

30 (b) *When the statement was made by such person in the ordinary course of business, and, in particular, when it consists of any entry or memorandum made by him or her in books kept in the ordinary course of business or in the discharge of professional duty, or of an acknowledgment written or signed by him or her of the receipt of money, goods, securities or property of any kind, or of a document used in commerce written or signed by him or her, or of the date of a letter or other document usually dated, written or signed by him or her;*

See also sec 32

Yeko Mukasa v AG (1993) IV KALR 8

R v Magandazi (1914) 2 ULR 108

- The person must be under duty to make such statements.
- The statement should be made before the dispute arises.

STATEMENTS AGAINST THE PECUNIARY INTEREST OF THE MAKER

Where someone has an interest in a matter but makes a statement against his interest, it may be admissible under section **30 (c)**.

Tucker v Oldbury Urban District Council (1912) 2 KB 317

Peacable D'Uncle v Watson 128 ER 232

Taylor v Witham (1876) 3 Ch. D 605

- The statement is one which exposes the maker to criminal liability.
- The maker should be aware of the consequences.
- It should be made before the dispute arises.

R v O'Brien

O'Brien and Jensen were jointly charged with possession of narcotics. O'Brien was arrested and tried for the offence but Jensen fled the country. O'Brien was convicted and Jensen later returned to the country and made the confession that he alone was the perpetrator of the crime and he died soon thereafter. After his death, O'Brien applied for review of his conviction and asked court to take into consideration the confession made by Jensen.

Court rejected this application to review the case holding that at the time of making that statement, the maker was already aware of the proceedings and that this statement could have been calculated to save his friend.

(d) *When the statement gives the opinion of any such person as to the existence of any public right or custom, or matter of public or general interest, of the existence of which, if it existed, he or she would have been likely to be aware, and when that statement was made before any controversy as to the right, custom or matter had risen;*

Dunraven v Llewellyn

(e) *When the statement relates to the existence of any relationship by blood, marriage or adoption between persons as to whose relationship by blood, marriage or adoption the person making the statement had special means of knowledge, and when the statement was made before the question in dispute was raised;*

(f) *When the statement relates to the existence of any relationship by blood, marriage or adoption between persons deceased, and is made in any will or deed relating to the affairs of the family to which any such deceased person belonged, or in any family pedigree, or upon any tombstone, family portrait or other thing on which such statements are usually made, and when the statement was made before the question in dispute was raised;*

Haines v Guthrie (1884) 13 QBD 818

(g) *When the statement is contained in any deed, will or other document which relates to any such transaction as is mentioned in section 12(a);*

(h) *When the statement was made by a number of persons, and expressed feelings or impressions on their part relevant to the matter in question*

THE RULE ITSELF

Although various formulations of the hearsay rule have been debated, the most comprehensive is that of Cross and Tapper¹²⁷ any assertion other than one made by a person while giving oral evidence in the proceedings is inadmissible as evidence of any fact or opinion asserted.

It is essential to determine the purpose for which evidence is tendered: the rule applies only when the object of the evidence is to establish the truth of what is contained in the statement. It is not hearsay when it is proposed to establish by the evidence, not the truth of the statement, but the fact that it was made.

The rule covers both assertions made by persons who do not give oral evidence and previous assertions by those who do. It covers both oral statements and those contained in documents. It is also now settled that the rule extends to what are known as "implied assertions": this is a rather misleading shorthand term for utterances or behaviour from which a fact (including a state of mind or an intention) may be inferred, although they are not intended to communicate that fact.

If evidence falls within the hearsay rule, it will be inadmissible unless it falls within an exception. The main implications of the rule are as follows.

¹²⁷ BAILII [Home] [Databases] [World Law] [Multidatabase Search] [Help] [Feedback] The Law Commission You are here: BAILII >> Databases >> The Law Commission >> Evidence in Criminal Proceedings: Hearsay and related topics [1997] EWLC 245(2) (19 June 1997) URL: [http://www.bailii.org/ew/other/EWLC/1997/245\(2\).html](http://www.bailii.org/ew/other/EWLC/1997/245(2).html) Cite as: [1997] EWLC 245(2) Page 1 of 8 Evidence in Criminal Proceedings: Hearsay and related topics [1997] EWLC 245(2) (19 J ...11/11/2008file://C:\Documents and Settings\Best\My Documents\law work\course units\Evidence\E .. - <http://www.clicktoconvert.com>

- (1) Witnesses must give oral evidence, and a written statement cannot be a substitute for their personal appearance in the witness box.
- (2) Witnesses must give evidence from first-hand knowledge, and may not repeat what other people have told them.
- (3) Records are inadmissible evidence of the matters they contain.
- (4) Where a witness gives oral evidence, only the oral evidence counts: previous statements by the witness generally do not.

THE EXCEPTIONS TO THE RULE CREATED BEFORE 1988

Common law exceptions

The common law exceptions to the hearsay rule have developed in a haphazard manner because, as Lord Reid has explained, in many cases there was no justification either in principle or logic for carrying the exception just so far and no farther. One might hazard a surmise that when the rule proved highly inconvenient in a particular kind of case it was relaxed just sufficiently far to meet that case, and without regard to any question of principle.

As might be expected where exceptions have been developed on a case-by-case basis, anomalies and overlaps have been created, and sometimes an exception does not seem to go far enough. However, Phipson¹²⁸ classifies the cases in accordance with what appear to be their rationales:

¹²⁸ Page 2 of 8Evidence in Criminal Proceedings: Hearsay and related topics [1997] EWLC 245(2) (19 J ...<http://www.clicktoconvert.com>

- (1) cases based on the assumption that what a person has said against his or her interests is likely to be true;
- (2) cases where it is recognised that where the witness is dead, it may be better to admit the witness's evidence rather than to deprive the court of all proof;
- (3) cases which recognise the force of common knowledge, where a fact is reputed amongst those who ought to know it but its source is unknown;
- (4) cases based on the intrinsic reliability of public records; and
- (5) cases where the contemporaneity of the statement itself is some guarantee of its reliability.

Applying these principles, the common law exceptions to the hearsay rule can conveniently be grouped under the following heads:

- (1) admissions and confessions of parties and of their agents;
- (2) statements by deceased persons:
 - (a) declarations against interest;
 - (b) declarations in the course of duty;
 - (c) declarations as to public interests;
 - (d) dying declarations (in the case of homicide);
 - (e) declarations as to pedigree;
 - (f) declarations by testators as to their wills;
 - (g) testimony given in a previous trial;
- (3) reputation (and, in all but (a), family tradition)
 - (a) of bad character;
 - (b) of pedigree;
 - (c) of the existence of a marriage;

- (d) of the existence or non-existence of any public or general right;
- (e) to identify any person or object;
- (4) public documents;
- (5) statements admitted as part of the *res gestae*; and
- (6) statements made by a party to a common enterprise, admitted against another party to the enterprise as evidence of any matter stated.

STATUTORY EXCEPTIONS CREATED BEFORE 1988

The House of Lords decided in 1965 that any further exceptions to the hearsay rule should be introduced by Parliament, not the judiciary; but the legislative changes to the rule have themselves been piecemeal and anomalous.

Under section 9 of the Criminal Justice Act 1967, a party may tender a written statement as evidence (rather than calling the maker of the statement) to the extent that oral evidence by the maker of the statement could have been adduced, provided that certain conditions are satisfied. This procedure is used frequently, but only for undisputed evidence, because an objection by an opposing party means that the statement cannot be used.

There are other statutory exceptions. For example, copies of entries in bankers books may be admitted as *prima facie* evidence of the entries or of the matters, transactions and accounts recorded in them; and transcripts of evidence may be admitted at retrials ordered by the Court of Appeal in circumstances governed by the Criminal Appeal Act 1968, Schedule 2, paragraph 1.

THE CRIMINAL JUSTICE ACT 1988

In the leading case of *Myers v DPP* Lord Reid recommended a major statutory review of the law of hearsay. In 1972 the CLRC made major recommendations for change in its Evidence Report. Its recommendations were not accepted, but instead a series of piecemeal measures were adopted.

When the Roskill Committee further examined the issue of hearsay evidence in 1986, it recommended that, in criminal proceedings arising from alleged fraud, documents should be allowed to speak for themselves and be admissible without further proof. Eventually Parliament passed the Criminal Justice Act 1988, which added important new exceptions but left many old ones untouched.

The 1988 Act is limited to hearsay statements contained in documents; but "statement" and "document" are both widely defined, so as to include "any representation of fact, however made" and "anything in which information of any description is recorded" respectively.

FORENSIC CRIME RECONSTRUCTION

The concept of a significant difference is important because it can be just such a difference that distinguishes an object from all other similar objects (i.e., an individuating characteristic that connects the digital evidence to a specific system or person).

Because every investigation is different, it is difficult to create standard operating procedures to cover every aspect of in-depth forensic analysis of digital evidence. Therefore, it is important to have a methodical approach to

organizing and analyzing the large amounts of data that are typical when computers and networks are involved. Forensic science in general, and crime reconstruction specifically, provides such a methodology. Crime reconstruction is the process of gaining a more complete understanding of a crime using available evidence. We use evidence to sequence events, determine locations, establish direction or establish the time and duration of actions. Some of the clues that are utilized in these determinations are relational, that is, where an object is in relation to the other objects and how they interact or relate to each other. Other clues are functional, the way something works or how it was used, or temporal, things based on the passage of time (Chisum, 1999). For example, when investigating a homicide perpetrated by an unknown offender, investigators try to determine how and when the victim was killed, as well as where the victim was and who the victim had contact with prior to the time of death. This reconstruction process often leads to the proverbial “smoking gun”—compelling evidence implicating a specific individual.

In a civil dispute, such as theft of trade secrets, the goal of e-discovery may be to uncover communications or documents showing that particular individuals knowingly accessed the data of concern during a particular period.

In late December 2005, 27-year-old Josie Phyllis Brown was reported missing in Baltimore. Digital evidence led investigators to a 22-year-old college student, John Gaumer. Brown met Gaumer on the Internet site MySpace.com and arranged to meet him for a date (Associated Press, 2006). On the night of her disappearance, Brown’s mobile telephone records showed that she talked to Gaumer before meeting with him, and police placed her telephone many miles

from where he claimed to have left her that night. After the web of evidence converged on Gaumer in February 2006, he led police to her body and admitted to beating Brown to death after their date.

Gaumer used the Internet extensively to communicate and meet potential dates. Part of the evidence against him was a digital recording of “thumping noises, shouting and brief bursts of a woman’s muffled screams” apparently created when Gaumer’s mobile phone inadvertently dialed Brown’s (McMenamin, 2007). In his confession to police, Gaumer stated that he removed her nose, jaw, teeth, and most of her fingertips in an attempt to thwart identification of her body, and that he later sent an e-mail to her account to make it appear that he did not know she was dead.

As another example, when handling a computer intrusion, we strive to determine how and when the attackers gained unauthorized access, and which computers were involved.

RELATIONAL ANALYSIS

A full relational analysis can include the geographic location of people and computers, as well as any communication/transaction that occurred between them. In a major fraud investigation involving thousands of people and computers, creating a detailed relational analysis—where each party was located and how they interacted—can reveal a crucial relationship. Similarly, in a network intrusion investigation, it can be useful to generate a diagram of which computers contacted the victim system, or to create a list of IP-to-IP connections and sort them by quantity of data transferred, as detailed in Chapter 9, “Network Analysis.”

F U N C T I O N A L A N A L Y S I S

Forensic examiners perform a functional analysis to determine how a particular system or application works and how it was configured at the time of the crime. It is sometimes necessary to determine how a computer system or program works to gain a better understanding of a crime or a piece of digital evidence. If a compromised web server was configured to allow connections from only a small range of IP addresses or user accounts, this limits the number of machines or user accounts that could have been used to break into the web server. Malware analysis is another example of functional analysis that is common in intrusion investigations, but this process is beyond the scope of this Handbook and has its own dedicated text.¹²⁹

T E M P O R A L A N A L Y S I S

One of the most common forms of temporal analysis is creating a timeline to gain a clearer overview of events relating to a crime and to help investigators identify patterns and gaps, potentially leading to other sources of evidence. There are other approaches to analyzing temporal data, such as plotting them in a histogram to find periods of highest activity.

When dealing with digital data, forensic practitioners must pay close attention to details. Misreading 03:15 and 3:15 pm will impact a temporal reconstruction and misreading 232.23.22.1 as 23.223.22.1 will impact a relational reconstruction. When performing temporal analysis, any discrepancies such as system clock inaccuracies and different time zones must be taken into account. Such seemingly minor mistakes can completely misdirect an

¹²⁹ (Malin et al., 2008)

investigation. In a number of cases, including child exploitation and intrusion investigations, dates and IP addresses were transcribed incorrectly when drafting search warrants. These simple transcription errors led to the wrong person being implicated until the error was corrected.

NETWORKS AND THE INTERNET

Beyond the basic requirement to collect evidence in a way that preserves its integrity and authenticity, there are a number of practical challenges that investigators can expect when dealing with networks. One of the most significant challenges of investigating criminal activity involving networks is obtaining all the evidence. Several factors generally contribute to this challenge. First, the distributed nature of networks results in a distribution of crime scenes creating practical and jurisdictional problems. For instance, in most cases it may not be possible to collect evidence from computers located in China. Even when international or interstate procedures are in place to facilitate digital evidence exchange, the procedures are complex and only practical for serious crimes. Second, because digital data on networked systems are easily deleted or changed, it is necessary to collect and preserve them as quickly as possible. Network traffic exists for only a split second. Information stored in volatile computer memory may exist for only a few hours. Because of their volume, log files may be retained for only a few days. Furthermore, if they have the skill and opportunity, criminals will destroy or modify evidence to protect themselves. A third contributing factor is the wide range of technical expertise

that is required when networks are involved in a crime. Because every network is different, combining different technologies in unique ways, no single individual is equipped to deal with every situation. Therefore, it is often necessary to find individuals who are familiar with a given technology before evidence can be collected. A fourth contributing factor is the great volume of data that are often involved in an investigation involving computer systems. Searching for useful evidence in vast amounts of digital data can be like finding a needle in a haystack. In the ideal case, when most of the digital evidence is available to investigators, another significant challenge arises when it is necessary to associate an individual with specific activity on a computer or network. Even when offenders make no effort to conceal their identity, they can claim that they were not responsible. Given the minor amount of effort required to conceal one's identity on the Internet, criminals usually take some action to thwart apprehension. This concealment behavior may be as simple as using a library computer. Additionally, there are many services that provide varying degrees of anonymity on the Internet, making the task even harder. Encryption presents the ultimate challenge, making it difficult or impossible for investigators to analyze evidence that has already been found, collected, documented, and preserved. This book addresses these challenges by providing a methodology for investigating criminal activities on networks, delving into common sources of evidence on networks and their practical use in an investigation.

With great achievements come great responsibilities. Digital forensics has progressed rapidly but much more is required, including developing more



sophisticated techniques for acquiring and analyzing digital evidence, increasing scientific rigor in our work, and professionalizing the field. This Handbook aims to contribute to the advancement of the field by expanding knowledge in the major specializations in digital forensics and improving our ability to locate and utilize digital evidence on computers, networks, and embedded systems. Specifically, the Investigative Methodology section of the Handbook provides expert guidance in the three main areas of practice: forensic analysis, electronic discovery, and intrusion investigation. The Technology section is extended and updated to reflect the state of the art in each area of specialization. The main areas of focus in the Technology section are forensic analysis of Windows, Unix, Macintosh, and embedded systems (including cellular telephones and other mobile devices), and investigations involving networks (including enterprise environments and mobile telecommunications technology)

CHAPTER NINETEEN



CRIME SCENE EQUIPMENT

Initial Responding Officer(s)

Essential*

- Consent/search forms.
- Crime scene barricade tape.
- First-aid kit.
- Flares.
- Flashlight and extra batteries.
- Paper bags.
- Personal protective equipment (PPE) * These items should be in police vehicles or readily available to initial responding officer(s).

Optional

- Audiotape recorder
- Camera with flash and extra film, if not digital camera
- Chalk
- Directional marker/compass
- Disinfectant (such as a 10% bleach solution)

- Maps
- Plastic bags
- Pocket knife
- Reflective vest
- Tape measure
- Tarps to protect evidence from the weather
- Traffic cones
- Waterless hand wash (towelette with germicide)
- Wireless phone E.

CRIME SCENE INVESTIGATOR/EVIDENCE

TECHNICIAN

Essential

- Bindle paper
- Biohazard bags
- Body fluid collection kit
- Camera with flash and tripod; extra film, if not digital; extra flash memory cards, if digital
- Casting materials
- Consent/search forms
- Crime scene barricade tape
- Cutting instruments (knives, box cutter, scalpel, scissors, etc.)
- Directional marker/compass
- Disinfectant (such as a 10% bleach solution)

- Evidence collection containers including rigid containers for firearms and ammunition boxes, pie boxes with sheet cotton for document recovery; manila folders
 - Evidence identifiers (numbers, placards)
 - Evidence seals/tape
 - First-aid kit
 - Flashlight and extra batteries
 - High-intensity lights
 - Latent print kit
 - Magnifying glass
 - Measuring devices
 - Permanent markers
 - Personal protective equipment (PPE)
 - Photographic scale (ruler)
 - Presumptive blood test supplies
 - Sketch paper
 - Tool kit
 - Tweezers/forceps
 - Window screen fabric in rolls or sheets
- * These items should be in vehicles or readily available to Crime Scene Investigator/Evidence Technician.



Optional

- Audiotape recorder
- Bloodstain pattern examination kit
- Business cards
- Chalk
- Chemical enhancement supplies
- Compass
- Entomology (insect) collection kit
- Extension cords
- Flares
- Forensic light source (alternate light source, UV lamp/laser, goggles)
- Generator
- Gunshot residue kit
- Laser trajectory kit
- Maps
- Marking paint/snow wax
- Metal detector
- Mirror
- Phone listing (important numbers)
- Privacy screens
- Protrusion rod set
- Reflective vest
- Refrigeration or cooling unit
- Respirators with filters

- Roll of string.
- Rubber bands.
- Sexual assault evidence collection kit (victim and suspect)
- Shoe print lifting equipment
- Templates (scene and human)
- Thermometer
- Traffic cones
- Trajectory rods
- Video recorder
- Wireless phone

Evidence Collection Kits (Examples)

Blood Collection

- Bindle
- Coin envelopes
- Disposable scalpels
- Distilled water or single use sterile water droppers
- Evidence identifiers
- Drying box
- Latex gloves
- Photographic ruler (ABFO scales)
- Presumptive chemicals
- Swabs Fingerprint
- Adhesive and gelatin lifting materials
- Brushes
- Chemical enhancement supplies
- Cyanoacrylate (super glue) wand/ packets
- Fingerprint ink pads, cards and card holders for exemplar collection



- Flashlight
- Forensic light source
- Lift cards, including 8 ½” x 11” card stock
- Lift tape
- Measurement scales
- Powders Bloodstain Pattern Documentation
- ABFO scales
- Calculator
- Laser pointer
- Permanent markers
- Protractor
- String
- Tape

Electronic and Digital Evidence Recovery

- Anti-static bags
- Bubble-wrap and other packing materials
- Cable tags and ties
- CDs and 3½-inch diskettes
- Faraday Bags
- Hand truck
- Nut drivers, hex and star-type
- Pliers: needle-nose and standard
- Rubber bands
- Magnifying glass
- Printer paper
- Secure-bit drivers
- Screwdrivers, non-magnetic flat-blade and Philips-type

- Tweezers, small non-magnetic
- Wire cutters Excavation and Evidence Recovery
- Cones/markers
- Evidence identifiers
- Hand tools (hammer, chisel/screwdriver, forceps, hand saw, box cutter, drywall saw, etc.)
- Metal detectors
- Paintbrushes
- Shovels/trowels
- Sifting screens
- String
- Weights
- Wooden/metal stakes Impressions – footwear, tire tracks and tool mark
- Bowls/mixing containers
- Boxes
- Casting Kit (e.g. Duplicast©, Mikrosil© or polyvinylsiloxane (PVS) materials, silicone-type sealant)
- Dental stone
- Evidence identifiers
- Material for forms
- Measurement scales
- Permanent markers
- Snow print wax
- Stirring sticks
- Water Pattern Print Lifter
- Chemical enhancement supplies
- Electrostatic dust lifter



- Gel lifter
- Wide format lift tape Trace Evidence Collection
- Acetate sheet protectors or clear secondary liners
- Bindle paper or weigh paper for bindles
- Butcher paper
- Clear packing/sealing tape 2 ½- to 4 inches wide
- Cotton-tipped swab
- Flashlight (oblique lighting)
- Forceps/tweezers (disposable or clean smooth tipped)
- Glass jars, bottles, vials with air-tight, screw-on lids
- Metal friction lid cans with fitting lids
- Slides and slide mailers
- Trace evidence vacuum with disposable collection filters
- Transfer pipettes (glass or plastic)

APPENDIX A. GLOSSARY

The definitions below apply to terms as used in this document.

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

Alternate light source (ALS): Equipment used to produce visible and invisible light at various wavelengths to enhance or visualize potential items of evidence (fluids, fingerprints, clothing fibers, etc.). Argon ion laser: The first generation of lasers used for detection of latent fingerprints. Expensive and non-portable, they have been supplanted by the introduction of solid-state and semiconductor lasers.

Bindle paper: Clean paper that is folded to contain trace evidence, sometimes included as part of the packaging for collecting trace evidence.

Biohazard bag: A container for materials that have been exposed to blood or other biological fluids. Biological fluids: Fluids that have human or animal origin, most commonly encountered at crime scenes (e.g., blood, mucus, perspiration, saliva, semen, vaginal fluid, urine).

Biological weapon: Biological agents used to threaten human life (e.g., anthrax, smallpox, or any infectious disease).

Bloodborne pathogen: Infectious, disease-causing microorganisms that may be found or transported in biological fluids.

Boundaries: The perimeter or border surrounding potential physical evidence related to the crime.

Case file: The collection of documents comprising information concerning a particular investigation. (This collection may be kept in case jackets, file folders, ring binders, boxes, file drawers, file cabinets, or rooms. Sub-files are often used within case files to segregate and group interviews, media coverage, laboratory requests and reports, evidence documentation, photographs, videotapes, audiotapes, and other documents.)

Case identifiers: The alphabetic and/or numeric characters assigned to identify a particular case.

Chase: A space in a wall or floor for pipes or ducts.

Chain of custody: A process used to maintain and document the chronological history of the evidence. (Documents should include name or initials of the individual collecting the evidence, each person or entity subsequently having custody of it, dates the items were collected or transferred, agency and case number, victim's or suspect's name, and a brief description of the item.)

Chemical enhancement: The use of chemicals that react with specific types of evidence (e.g., blood, semen, lead, fingerprints) in order to aid in the detection and/or documentation of evidence that may be difficult to see.

Chemical threat: Compounds that may pose bodily harm if touched, ingested, inhaled, or ignited. These compounds may be encountered at a clandestine laboratory, or through a homemade bomb or tankard leakage (e.g., ether, alcohol, nitroglycerin, ammonium sulfate, red phosphorus, cleaning supplies, gasoline, or unlabeled chemicals).

Clean/sanitize: The process of removing biological and/or chemical contaminants from tools and/or equipment (e.g., using a mixture of 10-percent household bleach and water).

Collect/collection: The process of detecting, documenting, or retaining physical evidence.

Comparison samples: A generic term used to describe physical material/evidence discovered at crime scenes that may be compared with samples from persons, tools, and physical locations. Comparison samples may be from either an unknown/questioned or a known source.

Samples whose source is unknown/questioned are of three basic types:

1. Recovered crime scene samples whose source is in question (e.g., evidence left by suspects, victims).
2. Questioned evidence that may have been transferred to an offender during the commission of the crime and taken away by him or her. Such questioned evidence can be compared with evidence of a known source and can thereby be associated/linked to a person/ vehicle/tool of a crime.
3. Evidence of an unknown/questioned source recovered from several crime scenes may also be used to associate multiple offenses that were committed by the same person and/or with the same tool or weapon. Samples whose source is known are of three basic types:

1. A standard/reference sample is material of a verifiable/documented source which, when compared with evidence of an unknown source, shows an association or linkage between an offender, crime scene, and/or victim (e.g., a carpet cutting taken from a location suspected as the point of transfer for comparison with the fibers recovered from the suspect's shoes, a sample of paint removed from a suspect's vehicle to be compared with paint found on a victim's vehicle following an accident, or a sample of the suspect's and/or

victim's blood submitted for comparison with a bloodstained shirt recovered as evidence).

2. A control/blank sample is material of a known source that presumably was uncontaminated during the commission of the crime (e.g., a sample to be used in laboratory testing to ensure that the surface on which the sample is deposited does not interfere with testing. For example, when a bloodstain is collected from a carpet, a segment of unstained carpet must be collected for use as a blank or elimination sample).

3. An elimination sample is one of known source taken from a person who had lawful access to the scene (e.g., fingerprints from occupants, tire tread impressions from police vehicles, footwear impressions from emergency medical personnel) to be used for comparison with evidence of the same type.

Contamination: The unwanted transfer of material from another source to a piece of physical evidence. Control/blank sample: See comparison samples.

Cross-contamination: The unwanted transfer of material between two or more sources of physical evidence.

Documentation: Written notes, audio/videotapes, printed forms, sketches and/or photographs that form a detailed record of the scene, evidence recovered, and actions taken during the search of the crime scene.

Drying box: A box intended to quickly dry multiple swabs with the aid of a fan blowing air through a chamber in which multiple swabs can be held apart from one another.

Dying declaration: Statements made by a person who believes he or she is about to die, concerning the cause or circumstance surrounding his or her impending death.

Electrostatic dust lifter: A device that operates by charging a plastic film, placed over the dust print, which creates electrostatic adhesions and draws the film onto the surface bearing the print. The dust particles are attracted to the film because of this charge and adhere to it. Elimination sample: See comparison samples.

Evidence identifiers: Tape, labels, containers, and string tags used to identify the evidence, the person collecting the evidence, the date the evidence was gathered, basic criminal offense information, and a brief description of the pertinent evidence.

Exemplars: A known sample of evidence created at the request of an investigator used for comparison to an unknown sample.

First responder(s): The initial responding law enforcement officer(s) and/or other public safety official(s) or service provider(s) arriving at the scene prior to the arrival of the investigator(s) in charge. Faraday bag: Specialty collection bags for electronic parts with lining to protect the contents from electromagnetic forces. Fluorescent powders: Powder intended to reveal latent prints which contain fluorescent chemicals that reveal itself under a forensic light source.

Forensic light source: see Alternate light source (ALS).

Impression evidence: Objects or materials that have retained the characteristics of other objects that have been physically pressed against them.

Infrared photography: A photographic process of recording images by using light from the infrared (IR) spectrum only, generally 700 to 900 nanometers.

Initial responding officer(s): The first law enforcement officer(s) to arrive at the scene. ***Investigator(s) in charge:*** The official(s) responsible for the crime scene investigation. ***Known:*** See comparison samples.

Latent print: A print impression not readily visible, made by contact of the hands or feet with a surface resulting in the transfer of materials from the skin to that surface.

Long-wave ultraviolet (UV) lamp: An ultraviolet light source that operates between 300-400 nanometers; useful for quickly scanning and documenting crime scenes when used in tandem with a UV- sensitive camera.

Major case prints: The recording of all friction ridge detail on the hands. This includes the fingers, fingertips, finger joints and edges of the fingers as well as the entire palm. Also known as “complete friction ridge exemplars.”

Matrix: The substance that is deposited or removed by the friction ridge skin when making an impression.

Measurement scale: An object showing standard units of length (e.g., ruler) used in photographic documentation of an item of evidence.

Multiple scenes: Two or more physical locations of evidence associated with a crime (e.g., in a crime of personal violence, evidence may be found at the location of the assault and also on the person and clothing of the victim/assailant, the victim’s/assailant’s vehicle, and locations the victim/assailant frequents and resides).

Nonporous container: Packaging through which liquids or vapors cannot pass (e.g., glass jars or metal cans).

Other responders: Individuals who are involved in an aspect of the crime scene, such as perimeter security, traffic control, media management, scene

processing, and technical support, as well as prosecutors, medical personnel, medical examiners, coroners, forensic examiners, evidence technicians, and fire and rescue officers.

Outsole: The portion of footwear that is in direct contact with the ground.

Personal protective equipment (PPE): Articles such as disposable gloves, masks, and eye protection that are utilized to provide a barrier to keep biological or chemical hazards from contacting the skin, eyes, and mucous membranes and to avoid contamination of the crime scene.

Porous container: Packaging through which liquids or vapors may pass (e.g., paper bags, cloth bags).

Porous surface: any surface that has tiny openings that absorbs liquids or allows them to pass through (e.g., furniture fabric, canvas, wood, wall board)

Presumptive test: A non-confirmatory test used to screen for the presence of a substance.

Projectile trajectory analysis: The method for determining the path of a high-speed object through space (e.g., a bullet emanating from a firearm).

Radiological threat: The pending exposure to radiation energy. (This energy can be produced by shortwave X-rays or through unstable isotopes.)

Single-use equipment: Items that will be used only once to collect evidence, such as biological samples, then discarded to minimize contamination (e.g., tweezers, scalpel blades, droppers).

Secondary Liner: Secondary liner is a clear polyester sheet or roll used in industry for stickers, seals, and other adhesive-containing materials to protect the adhesive until ready for use.

Standard/reference sample: See comparison samples.

Substrate: The surface upon which a friction ridge impression is deposited.

Team members: Individuals who are called to the scene to assist in investigation or processing of the scene (e.g., scientific personnel from the crime laboratory or medical examiner's office, other forensic specialists, photographers, mass disaster specialists, experts in the identification of human remains, arson and explosives investigators, clandestine drug laboratory investigators, as well as other experts).

Trace evidence: Physical evidence that results from the transfer of small quantities of materials (e.g., hair, textile fibers, paint chips, glass fragments, gunshot residue particles).

Transient evidence: Evidence which by its very nature or the conditions at the scene will lose its evidentiary value if not preserved and protected (e.g., blood in the rain).

Ultraviolet photography: A photographic process of recording images by using light from the ultraviolet (UV) spectrum only, generally less than 400 nanometers.

Unknown/questioned: See comparison samples.

Walk-through: An assessment conducted by carefully walking through the scene to evaluate the situation, recognize potential evidence, and determine resources required. Also, a final survey conducted to ensure the scene has been effectively and completely processed.

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ABOUT THE BOOK

Everything is a self-portrait. A diary. Your whole drug history's in a strand of your hair. Your fingernails. The forensic details. The lining of your stomach is a document. The calluses on your hand tell all your secrets. Your teeth give you away. Your accent. The wrinkles around your mouth and eyes. Everything you do shows your hand. (Chuck Palahniuk)

This book gives an understanding of the application of forensic sciences to the law. It covers the crime scene investigation process, and provides an overview of the various kinds of forensic evidence that may be collected and presented in court. Points out the identification, documentation and collection of physical evidence, including fingerprints, shoe impressions, hair fibers, firearms evidence and questioned documents. It considers biological evidence, including DNA, blood spatter and other fluids, forensic anthropology and odontology.

Finally, the book engages fire investigation and forensic accounting and is designed to provide a foundation in the field of criminalistics who are interested in the use of science and law to solve crime, and considers the impact of television and other media on the field of Forensic Science and the courtroom.