Final Analysis Forensics

Death Investigation *Criminalistics Forensic Analysis*

November 8, 2004

Executive Summary of Investigation:

The objective of this reinvestigation focused on determining how Col. James Emery Sabow died in 1991: suicide or murder? Investigative focus included *only* scientific and medical evidence and specific issues such as:

- The behavior of the 12 gauge Winchester Dove & Quail birdshot round fired
- The behavior of the 12 gauge double barrel shotgun firing the round
- The minimal bloodstains present on the decedent
- The so called aspiration of blood despite a massive brain stem injury
- The swelling behind the victim's right ear possibly the result of blunt force trauma
- The lack of "finger prints" on the shotgun and shot shells

This investigation was difficult and time consuming due to several factors:

- The age of the case (1991)
- The lack of adequate scene documentation
- The recent destruction of autopsy samples
- The lack of Dr. David Sabow's cooperation with the following:
  - His refusal to provide relevant evidence (the shot gun) in his possession
  - His refusal to provide other evidence he claims sufficient to prove murder
  - His pressure on me to conclude that his brother was murdered

Overcoming these difficulties involved testing and experiments which support that:

- Gases discharged into the skull [leaving no exit] aerated blood in the lung producing the appearance of 'aspiration' or bubbles in the blood
- Col. Sabow was seated and leaning forward with the weapon in his mouth when the shot was fired
- Col. Sabow held the muzzle with his left hand, discharging the trigger with his right hand producing multiple linear displaced fractures of the skull
- Skull fragments, and soft tissue destruction appears as swelling on the neck behind the right or left ear, depending upon the heads movement and position
- The decedent suffered no trauma other than the shot gun blast into his mouth
- "No fingerprints" means finding no "identifiable prints," not "no marks whatever"
- Mishandling the weapon at the crime scene could have destroyed or obliterated fingerprints

A review of prior investigations finds errors: e.g. failing to document the weapon and the decedent's right hand, but no errors prevent the just resolution of this case

The review, experiments, and testing warrants the conclusion that Col. Sabow died from a self-inflicted shotgun wound to the mouth, an action which clearly explains all his injures and thereby explains his death as a suicide.

QED

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Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

Colonel James E. Sabow

Death Investigation & Evidence Analysis

Our Case # 04-0514

Final Report

With Appendices & CD Data

Prepared For

Mr. John Awtrey, Director
Office of Law Enforcement Policy & Support
OUSD (P&R) PI
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Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

November 7, 2004 **CONFIDENTIAL**

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For: Assistant Secretary of Defense Mr. Charles Abell & The House Armed Services Committee, The Honorable Henry Hyde, Chair

Reference: Shotgun Death of Col. James E. Sabow
Final Analysis Forensics Case #04-0514
Federal Contract #HQ0095-04-C-0022

Dear Mr. Awtrey, Assistant Secretary of Defense Abell, and the Honorable members of the House Armed Services Committee:

The following represents my initial report, organized into four (4) parts, Part One, Part Two, Part Three, and Part Four, including my opinions, about the above referenced case. Should additional information be provided to me beyond what I have listed as 'Information Reviewed,' Appendix II, I reserve the right to revise my report, reassess these opinions, and reevaluate their scientific bases upon completing my review of this new data. In Appendix I, I provide a brief glossary of relevant terms used in the forensic sciences and in forensic medicine; Appendix III lists the drawings, notes and photographs and correspondence resulting from my investigation. Please refer to my CV, attached as Appendix IV, for my relevant training and experience. For the committee's reference, I have also supplied the relevant details of my past courtroom and deposition appearances as Appendix V. As you know, I have never consulted for you in previous cases, nor have I ever testified as your witness in a court of law or in any other forum.

Organization and Presentation of this Report

This report is preceded by an Executive Summary attached separately and is organized into four parts followed by five appendices. Photographic and video data is also provided on accompanying CDs provided as part of this report. Two supplemental reports are yet forthcoming, but only upon official request: one on sampled gunshot residues currently undergoing EDX analysis; the other on gas pressure calculations and measurements applying piezoelectric and strain gage computer technology. The information they could provide merely adds to the available data and is not considered critical to the investigation or to the results reached through this scientific effort.

This report is organized as follows:

[Executive Summary]

Part One
Preliminaries & Clarifications:
- Brief history of this case
- My Assignment in this case
- Terminology

Part Two
Scientific Questions raised by Dr. Sabow addressed through testing & experiment:
- Investigating Reports vs. Investigating Hard Evidence
- Bloodstains present on hands but absent on torso
- Aspiration of blood & massive brain stem injury
- Swelling behind the victim's right ear & possible blunt force trauma
- Absent Fingerprints on the shotgun & shot shells

Part Three
Issues with other investigations:
- Official Investigations
- Unofficial Investigations
- Questions of Motive

Part Four
Pressures on this investigation:
- Summary
- Conclusions

[For ease of document handling and reproduction via photocopy, photographs appear in Appendix III and on an included CD to allow both black and white and color printing].

Part One

Preliminaries & Clarifications:
- Brief history of this case
- My Assignment in this case
- Medical terminology & miscommunications

<u>Necessary Preliminaries – Clarification of Terms and Activities</u>

"Crime Scene" or "Event" Reconstruction & Scientific Method

A crime scene or event analysis and reconstruction logically link a detailed series of scientific ***explanations*** to provide an understanding of the sequence of events leaving physical evidence. Each explanation is developed, linked, and evaluated by applying ***the scientific method*** to this available data.* This process involves proposing, testing, and evaluating explanatory connections among the physical evidence found to be related to

these events. The purpose of the analysis is to determine the ***best explanation*** of these related events.

Caveats & Required Components

1. Such analyses rely upon the availability of ***all*** the evidence, and the analyst's unbiased application of logical scientific methods. Data includes statements, reports, diagrams, photographs and physical evidence. The ability to apply proper logical methods develops in the analyst through relevant education, training, and experience but involves skills not unfamiliar to the average person. ** Thus, jurors, attorneys, and the court should be able to understand the logic behind the reconstruction.

2. Such analyses may also face logical limitations which must be recognized and explained by the analyst as part of the reconstruction. *No reconstruction can explain every element of an event.* Many sequences may escape scientific detection, or if detected, may supply no logical grounds for inclusion.

3. Such analyses must remain logically open to the discovery of new data which may prove to be relevant to the events, and as such, may supply new evidence. In that event, the analyst must reserve the right to consider this new evidence, and reassess the reconstruction in its new light.

Notes

*I have detailed the nature, scope, and application of **scientific method** in my book *Dead Reckoning: The Art of Forensic Detection*, CRC Press, December, 1999. The book includes concrete examples of the logic essential to the development of scientific explanations by the natural sciences in general and forensic sciences in particular. I have also explained the nature of **scientific method** in two chapters of my book *Forensic Science: An Introduction to Scientific and Investigative Techniques, edited with Stuart James*, CRC Press, August, 2002.

A simple example of this logic may suffice. Suppose upon entering a room that you see a yellowish-fluid puddle on the white linoleum floor. A small puppy wiggles submissively as it runs up to greet you at the room's entrance. What explains the puddle? The logic relevant to crime scene or event reconstruction is the same logic that licenses your explanation of the puddle. Please note that *mathematical probability DOES NOT play any **essential role here.* The process does not involve discovering complex probabilistic relationships allowing us to rank alternative explanations numerically. Instead, the process involves discovering supporting, or refuting *evidence.* Thus it is mistaken to say that one sequence of events *is more likely* than some other. It is correct to say that one sequence of events *best explains* the puddle, given the evidence. Also please note that any explanation offered can be tested in at least one, if not several ways. Given your explanation of the puddle, what tests would you recommend for ruling it in, or tossing it out?

"Bloodstain Pattern Analysis" & Scientific Method

Bloodstain pattern analysis involves the scientific study of the static consequences which result from dynamic blood shedding events. The study involves analyzing the size, shape, distribution, and pattern of the stains as well as the nature of their target surfaces. The purpose of the study is to help identify the nature of those blood shedding events which produce the patterns under investigation. A bloodstain pattern analysis, when reasoning beyond specific blood shedding patterns and their properties, becomes a specific form of crime scene or event analysis and reconstruction. It applies the tools of an event reconstruction, explained above, but focuses specifically upon explaining blood shedding events at the places and times in question. Evidence includes the number, character, and relationships among bloodstains present at the scene, on the victim and the victim's clothing, on the suspect and the suspect's clothing, on any weapons, vehicles, or other surfaces capable of sustaining bloodstains.

A bloodstain pattern analysis includes the identification of available stains as *human* bloodstains, as blood of a certain human blood type, or even as blood from specific individuals through a DNA analysis of relevant samples. Such analyses are usually provided by qualified serologists and DNA technicians at certified laboratories. Blood testing has developed great sophistication over the years. [Its history, including presumptive tests for blood, and historically significant tests developed for determining blood type, are available upon specific request].

Note: I currently serve [along with about 30 other bloodstain pattern analysts from around the world] on the FBI's *Scientific Working Group on Bloodstain Pattern Analysis* [SWGSTAIN], a group charged with the task of developing both scientifically rigorous protocols for doing this scientific work as well as for establishing criteria, including both the experience and the training, necessary to be considered a 'scientific expert' in the field. The chair of the group is SA Tony Ajonorato (703-632-7489) from the FBI Crime lab in Quantico Virginia. Of course a scientific 'expert' in any given case is so defined by the courts on a case by case basis depending upon jurisdictional issues etc. – however many true scientific experts in apparently related fields may not qualify as scientific experts in bloodstain pattern analysis. The field has its own set of applied and theoretical scientific principles from physics, chemistry, serology, and crime scene analysis defining a set of scientific knowledge and forensic skills which in turn have lead to the development of unique testing and research realms within the forensic sciences.

"Ballistics Analysis" & Scientific Method

Ballistics is a branch of classical physics covering the flight of projectiles. The famous American forensic scientist Calvin Goddard [circa 1920's], said to be the 'father of modern ballistics' in the forensic setting, applied the term much more broadly to include the study of firearms as tools which leave distinct marks on the projectiles they deliver. Ballistics, in the forensic setting, as evolved from classical physics, has at least three branches: internal ballistics, or the study of a projectile's movement within a firearm; external ballistics, or the study of a projectile's movement from muzzle to target; and

terminal ballistics, or the study of a projectile's movement through a target, usually but not always restricted to damage inflicted upon human tissues. [Work within this restriction to human tissues requires further expertise in forensic medicine, which lies beyond the scope of ballistics itself.]

Ballistics examiners undertake a number of distinct tasks. Besides conducting microscopic comparisons among bullets, cartridge cases, firing pins, gun barrels, and various gun parts, the examiner also studies bullets and cartridge cases to identify the make and model of the weapon which fired them. This may also involve the disassembly and testing of various firearms and various ammunitions, restoring obliterated serial numbers, or conducting failure analyses when weapons malfunction, causing injury or death.

Suitably trained ballistics examiners may also significantly participate in what I have called crime scene reconstruction, as described above. This work may involve incorporating research conducted, for example, on the ejection patterns of semi-automatic or fully automatic weapons to help determine the possible positions of shooters using this type of armament while leaving ejected cartridge cases at the resulting undisturbed crime scene, or research on the many principles and properties involved in the areas of internal, external and terminal ballistics.

Brief History of this Case

On Tuesday January 22, 1991 at about 9:30 AM, Mrs. Sara Sabow discovered her husband, Colonel James Emery Sabow, 51 year old Caucasian male, dead in the back yard of their Marine Corps Air Station home in El Toro, California (MCAS-El Toro). He was dressed in his pajamas, bathrobe, and slippers. A double barrel 12 gauge shotgun with its muzzle pointing toward his head was found underneath the prone body. One barrel had been fired: both barrels were loaded with 12 gauge Winchester Dove & Quail bird-shot. A lawn chair was lying upside down on his lower flank. Mrs. Sabow stated that

"I ran to his side, knelt down, and lifted his head into my lap. As I did so, touching Jimmy's head, I felt a huge swelling on the right rear of his head. I lifted him a little further and looked at the right rear of his head. I saw a huge swelling." [AFFADAVIT (sic.); Affidavit of Sara Townsend Sabow, page 17.]

Photos were taken by NIS and a scene video tape was made depicting these discoveries.

The subsequent medical and scientific investigation conducted by the Orange County Sheriff-Coroner's Office, Santa Ana California, with invited participation by the NIS [now the NCIS] concluded that Col. Sabow died from a self-inflicted shotgun wound to the head, with the shotgun wound entering the mouth but not exiting. Death was reportedly caused by massive cerebral contusions and lacerations, reportedly in turn due to this single shotgun wound to the head. The manner of Col. Sabow's death was ruled a suicide. Both agencies issued reports documenting their investigations (ROI's or Report of Investigation(s)).

The decedent's wife, Mrs. Sara Townsend Sabow initially believed that her husband had committed suicide. She stated that as Commanding Officer of All Air Operations for the United States Marine Corps in the Western United States and as the Assistant Chief of Staff for the El Toro Air Station under Chief of Staff Col. Joseph Underwood, he was to succeed Col Underwood as acting Chief of Staff under Base Commander Brig. Gen. Tom Adams after Col. Underwood had been relieved of his command pending an investigation into the illegal use of military aircraft for non-military purposes. Her husband had apparently become despondent over his own removal as Col. Underwood's successor, and over a pending investigation concerning allegations that he too was involved in the illegal use of military aircraft for non-military purposes. Apparently these allegations were soon to be made public in a pending newspaper article. She stated that Col. Sabow remained a very proud man, dedicated to his exemplary service to the USMC, and, as anyone in his position, he did not tolerate anyone impugning his character or questioning his dedication to the USMC.

After a meeting with Brig. Gen. Adams on March 9, 1991, this opinion apparently changed. Mrs. Sara Townsend Sabow was joined by her brother-in-law Dr. J. David Sabow, a physician and practicing neurologist and the brother decedent's brother, for a family meeting with General Adams and other military officers (Gen. J. K. Davis, Gen. David Shuter, Col. Rich, and others not recognized by Mrs. Sabow) concerning Col. Sabow's death investigation. During this meeting, the decedent's brother (Dr. J. David Sabow) raised many questions about the nature of his brother's death and the circumstances of the pending investigation into his allegedly illegal activities. These questions were apparently met, at the very least, with outright hostility. According to both Mrs. Sabow and her brother-in-law, the meeting quickly turned into an acrimonious, emotionally charged confrontation between Dr. Sabow and Gen. Adams (and others) during which Mrs. Sabow and Dr. Sabow were treated with much less than the common courtesy usually afforded to the families of dead servicemen.

During this meeting, Dr. Sabow presented many of his own theories concerning both the actual death of his brother and its subsequent death investigation. Both Dr. Sabow and Mrs. Sabow left the meeting outraged at what they described as their harsh treatment, believing that the investigation into Col. Sabow's death involved the cover-up of a conspiracy to murder Col. Sabow in order to keep him silent about the illegal military activities which had come to his official attention. They also believed that the meeting's agenda was simply to silence them by convincing the family that Col. Sabow was guilty of embarrassing crimes, and that Col. Sabow had killed himself to avoid public humiliation. They concluded that they were being forced and manipulated into dropping their inquiries in order to protect the decedent's reputation.

In a U.S. Naval Investigation Service [NIS] report written by (b)(6),(b)(7)(C) on 05 February 1991 she states that:

Dr. Sabow opined that Col. Sabow was the one person who could have "shot this whole thing" [referring to the IG investigation (into the illegal use of military aircraft)] for everybody. According to Dr. Sabow, when Jim told Joe Underwood he would "fight this thing," Joe got upset and told him they would turn it into a felony, and Jim would loose (sic.) [lose] everything. Jim was concerned by that information, knowing he

could not get his pilot's license and work for America West [airlines] with a felony conviction, so he called his attorney, (b)(6),(b)(7)(C) After talking to (b)(6),(b)(7)(C) Jim's conscience was eased because (b)(6),(b)(7)(C) told him that would not happen. Dr. Sabow said it, by chance, Joe talked to Jim the morning of Jim's death and Jim expressed an interest in "fighting" this investigation, and going for a court martial, Joe might have gotten very upset. Fr. Sabow said given what he knows about his brother, he cannot accept that Jim would commit suicide. Dr. Sabow wanted assurances that this investigation would be conducted thoroughly, to determine whether or not foul play could have been a part in his brother's death (page 6 of 6).

Dr. Sabow had expressed this concern about his brother's death about one month before the ill-fated meeting noted above. It appears that Dr. Sabow's confidence in the rigor of official investigations had been irreparably destroyed by that meeting. It also appears, as reported by (b)(6),(b)(7)(C) that Dr. Sabow "cannot accept that Jim would commit suicide." This belief, coupled with his distrust of official investigative efforts, may have lead to Dr. Sabow's own involvement in the investigation of his brother's death.

In what became a dedicated attempt to uncover what he believes to be the true explanation of his brother's death, Dr. David Sabow has spent the last 13 + years and a considerable amount of his own money in an attempt to prove that his brother was murdered in order to prevent him from revealing a conspiracy involving the illegal use of military aircraft to transport weapons and drugs for nefarious political purposes. Dr. Sabow has been aided in this work by numerous scientific experts and by an apparently experienced investigator, Mr. Gene Wheaton. [The scientific substance of this work, as it was made available to me, is discussed below. Issues of motive & clandestine weapons and drug trafficking remain beyond the scope of this scientific inquiry – whatever may be said for these issues, it appears that the fruits of Dr. Sabow's investigation could be used to support motives for suicide as well as to provide a motive for homicide, thus in my opinion, these issues, true or not, remains moot at best regarding the manner of Col. Sabow's death and do not form part of this inquiry].

Additionally, and perhaps despite his skeptical view of official investigations, Dr. Sabow's persistence resulted in a second JAGMAN investigation (1991), an OIG review of the original NIS investigation (1996), and an FBI Equivocal Death Investigation (2001). The latter investigation included interviews with the scientific experts listed by Dr. Sabow as having reviewed the physical evidence, including photos and x-rays, and as having concluded from this review that Col. Sabow's death was the result of homicide, *not suicide*.

His persistence also resulted in my own involvement with this case. I was retained to conduct an independent *civilian* review and analysis of Col. Sabow's death, reporting to Mr. John Awtrey, of Law Enforcement Support Services, the Department of Defense, under Assistant Defense Secretary Mr. Charles Abell, on behalf of the House Armed Services Committee. My efforts represent an independent, non-governmental overview, review, and analysis of the entire case, with a focus on the forensic scientific and forensic medical aspects.

Prior investigations into the death of Col. James Sabow providing reports of [their] investigations (ROI's) were reviewed for my own investigation and are listed as follows:

1. Investigation of scene & autopsy done by Orange County Sheriff-Coroner's Office Santa Ana California [with scene and autopsy assistance/participation/attendance requested from the NIS] Tuesday, January 22, 1991 – ROI dated

2. NIS Investigation [Naval Investigative Service – now the NCIS (Naval Criminal Investigative Service)] ROI August 27, 1991

3. Two JAGMAN [Navy Judge Advocate General Manual] Investigations ROI dated February 7, 1991 and ROI dated December 17, 1991

4. Office of the Inspector General (OIG) Department of Defense Oversight review of the NCIS Investigation ROI dated June 5, 1996

5. FBI Behavioral Analysis Unit (BAU) Equivocal Death Investigation – ROI dated October 30, 2001 – SSA Mark Safarik

In addition, a VHS scene video tape, multiple copies of seventy eight (78) scene photographs (A-ZZZ), thirty nine (39) autopsy photographs (A-MM), and a single set of thirteen (13) x-rays were also provided to me for my work. My own report and analyses of the scientific elements in this case follows below.

Information Reviewed in this case:
[Please refer to the attachment entitled Appendix II, "Information Reviewed" for the list of documents, photographs, x-rays and records which I reviewed for my analyses in this case] All my opinions in the death of Col. James E. Sabow, USMC, are based upon my analyses of this data as provided to me by the DOD, as requested from Dr. David Sabow, and as developed through my own interviews, research, and scientific testing].

My Assignment in this Case:

I was retained to examine, analyze, and interpret the available ***scientific and medical evidence*** including ***bloodstain patterns, ballistics, and the terminal ballistics of injury*** in this previously investigated [and previously reinvestigated] death case in order to help determine, if the scientific and medical evidence warrants, whether this evidence shows that Col. James E. Sabow died by his own hand, or shows that Col. James E. Sabow died by another's hand. This effort also involves elements of scientific crime scene reconstruction, bloodstain pattern interpretation, and ballistics as detailed above.

To do so, I was asked to review the previous investigations into his death [ROI's listed above], with my focus remaining upon the scientific and medical evidence available in this case and as developed through these other, as well as my own investigations.

To that end, I was asked to conduct any testing and experiments deemed relevant in the course of my scientific work. If interviews were appropriate, I was asked to conduct them.

I was asked to pay specific and careful attention to the ***scientific and medical elements*** of the investigation designed and conducted by Dr. David Sabow, the decedent's brother, purporting to "prove that Col. Sabow was murdered."

I was asked to document any external pressures applied to me as I reinvestigated Col. Sabow's death regardless of their source(s). [See **Part Four**, below]

Finally, I was asked to write a detailed report documenting my analyses in order to fulfill the obligations detailed in Federal Contract #HQ0095-04-C-0022. Originally I was to complete this work by September 30, 2004. I requested and was granted an extension to October 31, 2004 in order to complete this work. Another extension became necessary, with the official due date for the report pushed back to November 8, 2004.

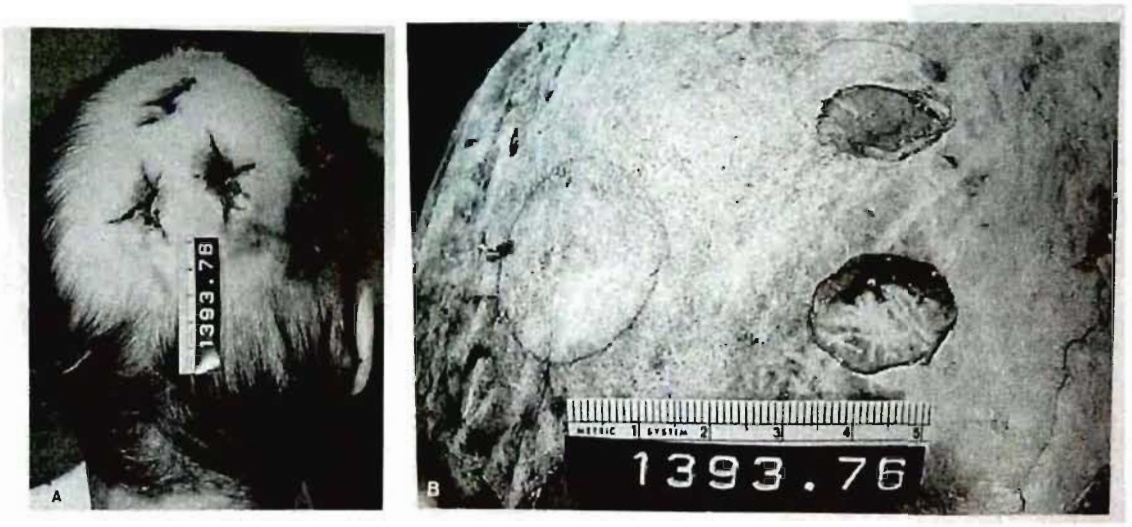
Terms & Concepts Involved in this Case
[For a brief glossary of associated bloodstain pattern terms, please see Appendix I]

Shotguns
Unlike rifles and handguns, shotguns have a smooth barrel without rifling: they are simple steel tubes which carry projectiles without imparting a spin on the round or pellets. They are organized by gauge: the size of the barrel opening. The most common is 12 gauge with gauge referring to the size of the bore: this means that 12 round lead balls of bore diameter equal one pound – each ball weighing $1/12^{th}$ of a pound. Each barrel usually has some degree of choke: this means that the muzzle is somehow constricted to enable pellets to fly in a tight cluster farther – farthest together with a full choke, then less far together with a half choke, quarter choke and so on. The lower the gauge, the bigger the bore; the higher the gauge, the smaller the bore.

Shotgun Shells
Shot shells were once paper but now are made of plastic materials. The Winchester round which fired into Col. Sabow's mouth was a Winchester Dove & Quail round, today called a Game Load: a relatively low power shot with over 300 small bird-shot pellets. Not all shot shells are equally powerful. The birdshot load and target loads used for skeet shooting are among the LEAST powerful 12 gauge rounds.

Skull Fractures
A so-called "depressed skull fracture" is a fracture caused by a blow from outside the skull, such as being hit with a hammer. On the other hand, a displaced skull fracture is a fracture in which the margins of two sides of a fracture line separate and overlap – usually because the skull bone is articulated only by the adhering soft tissues. Some victims of the World Trade Center attack on America, for example, suffered such devastating fractures. To say that one boney surface appears beneath another is not usually what common usage means when we say that someone suffers a 'depressed skull fracture. Usually the use of "depressed skull fracture" implies that the damage came from a blow to the outside of the skull from the outside of the skull. The use of displaced skull fracture is used more descriptively simply to capture the relationship among the bones

fractured in some catastrophic event. The following photographs show depressed skull fractures:



Bloodstains

Bloodstain pattern analysis is the scientific study of the static consequences resulting from dynamic blood shedding events. Not everyone who knows anatomy has the qualifications to interpret bloodstain patterns. This is a forensic specialty which requires training and years of experience in which to gain proficiency.

Gunshot residues

When weapons discharge, the explosion of the primer and gunpowder result in residues of heavy metals and both burned and unburned gunpowder associated with the shell involved. Detection of such residues can place hands, for example, in close proximity to the discharge of a weapon, depending upon the unique properties of the weapon at issue. Of interest in this case: what are the properties of the actual Ithaca shotgun? Does that weapon leak at the breach, leaving gunshot residues GSR's on a shooter's hand?

Part Two

Scientific Questions raised by Dr. Sabow addressed through testing & experiment:

- Investigating Reports vs. Investigating Hard Evidence
- Swelling behind the victim's right ear & possible blunt force trauma
  - Body
  - X-rays
  - Autopsy photographs
  - Weapon & its behavior, ammunition & its behavior
- Bloodstains present on hands but absent on torso
- Aspiration of blood & massive brain stem injury
- Shot while lying prone or shot while seated?
- Absent Fingerprints on the shotgun & shot shells

Reports vs. Hard Evidence

Dr. David Sabow has been critical of each earlier investigation, and through his valiant efforts, this investigation was initiated. After reviewing these earlier efforts, I have first address his concerns through both my analysis of existing evidence and through my own testing and experiments.

In his critical remarks he point to areas he considers to be defects among these investigative efforts. First, he criticizes the reinvestigations because they simply reviewed reports of earlier investigations without looking at any "hard physical evidence." I have attempted to avoid this problem as follows:

First I requested from Dr. Sabow all the hard physical and documentary evidence which he says he has gathered in the 13 years he has been involved in reviewing his brother's death. The evidence that I request included the Ithaca Model 200E side-by-side double barrel shotgun and any remaining ammunition from the box housing shells involved in the death. He has repeatedly denied my request for such evidence, including the weapon, stating that the gun could provide no relevant data according to "world renowned experts" he has consulted, and that sending me the gun would cause undue hardship for the family. I have not received any of the materials requested from Dr. Sabow for this investigation. I find this puzzling to say the least.

Second, I requested all the autopsy materials from the Orange County Coroner's Office, including soft tissue samples of cervical spinal cord with medullary fibers, all histology, toxicology, recovered projectiles and wads, and any other materials from Col. Sabow's autopsy. I was told by Le'Lonnie Sylvester, Office Supervisor or the Orange County Coroner Division, that all wet tissues from the autopsy were destroyed 07-17-2000, all post-mortem blood was discarded on 07-14-2003 and that all toxicology samples were discarded 07-28-1991. Thus, no "hard evidence" is available for analysis in this case, unless it can be provided by Dr. Sabow. Yet Dr. Sabow is mysteriously unwilling to provide me with the weapon or any other evidence which he claims to possess.

Third, I requested any materials from the persons Dr. Sabow consulted as his experts. Those who replied to my written requests indicated that they were provided either an x-ray or photo of the decedent from Dr. Sabow, and statements made by Dr. Sabow as the basis of their opinions.[1] It became clear that they had no new data upon which their opinions were based – in fact, it became clear that they had even less data than had been supplied to me in the form of the VHS scene video tape, multiple copies of seventy eight (78) scene photographs (A-ZZZ), thirty nine (39) autopsy photographs (A-MM), and a single set of thirteen (13) x-rays.

The purpose of a death investigation report, an autopsy report, and the associated documentations of a crime scene or death scene, both notational and photographic, is to provide data which allows further investigation when areas initially unrecognized as significant are later determined through subsequent investigation to be significant. In that

[1] See Appendix III for copies of all correspondence, including their replies to my queries.

sense, *a properly crafted report is hard evidence*. Thus, the importance of proper crime scene documentation cannot be overstressed.[2] Only through such documentation can questions arising later on be answered. Unfortunately, errors in documentation were made in this case which make it more difficult to answer such questions clearly without additional effort [see **Part Three**, below for a critical review of both official and unofficial investigations]. However, this additional effort, provided through scientific analysis and scientific testing and experiment, can help rationally resolve the issue of the decedent's manner of death.

Hard Evidence: The Body

Col. James Sabow, USAF

A Single Shotgun round discharge in his mouth resulted in all of Col. Sabow's observed injuries: we do not have the body; therefore we must rely upon the x-ray and photographic record as a relevant documentation of the body. This documentation is hard evidence.

GSW	IN	OUT	FOUND	TRACE:WOUND	TRACE:BODY	TRAJECTORY
A	Mouth	No exit	Multiple 12 gauge 'dove and quail' pellets in skull area	BLOOD from nose and mouth; right ear	None recovered GSR on left hand No GSR on right hand	A→P; upward F →B around closed mouth with barrel apparently supported by left hand

X-ray Hard Data

X-Ray Analysis
Head x-rays show extensive skull injuries: a series of so-called "eggshell" skull fractures appear; such fractures became easily displaced with movement of the body – from seated position to prone; from prone to head moved by Sally Sabow; from movement of body to autopsy and movement of the body and placement of the head during autopsy. The head is basically still held together by soft tissues only, with the integrity of the skull compromised by these fractures. Thus, the bones move beneath the skin and soft tissue with one fracture margin moving beneath the adjacent margin. These skull fractures are best called "displaced linear fractures," but no so-called "depressed fractures" are evident on any of the available films: my analysis was confirmed by peer review on 07-21-04 by a consultation with Dr. Timothy Flarity, MD, former Chairman of the Board, AMA [American Medical Association]; world renowned radiologist from Appleton Wisconsin. Although his experience is not in the realm of forensic science and medicine, his expertise in radiography and radiology *appropriately applies* to reading and interpreting this x-ray. He reviewed all the available x-rays in the case and did not limit himself to one view of the skull.

[2] See my article, Crime Scene Management in the United States, Encyclopedia of Forensic Science & Medicine, Elsevier Publishers, 2004.

Dr. David Sabow, in his critique of prior investigations, insists that this x-ray evidence shows "depressed skull fractures." He and his non-forensic colleagues are correct if they simply mean that one margin of a fractured bone presents above the margin from which it has separated through fracture. [However that is not how the term is commonly used in medicine.] The issue may appear merely terminological, [see **Part One**, terminology above] but Dr. Sabow implies more than in his use of the term 'depressed:' he implies that as a "depressed skull fracture," the fracture was produced by a force vector from outside the surface of the skull fracturing the bone, and thereby depressing it, one fracture margin over the other. This, he thinks, licenses his conclusion that Col. Sabow was struck somewhere in the back of the head before he was shot in the mouth with the Ithaca Model 200E firing Dove and Quail shot shell ammunition. However, this interpretation is not supported by any physical evidence; indeed the contrary interpretation is supported by the totality of the available physical evidence [see below].

The "swelling" behind the ear and on the neck at the skull's base that Dr. Sabow notes results from the head having moved after suffering the linear fractures from the shotgun blast into the mouth. The skull bones have 'displaced' with one fracture overlapping the other similar to the way one playing card can overlap another in a card player's hand. The subcutaneous bleeding resulting from the massive contusions and lacerations as well as from the skull fractures themselves also contribute to this obvious swelling. The source of the damage producing this 'swelling' comes entirely from the shot gun injuries. There is absolutely no indication or evidence that the swelling described by Dr. Sabow results from an independent blow to the back of Col. Sabow's head from outside the skull. Indeed if such a blow had occurred sufficient to render the decedent unconscious and unable to defend himself, the soft tissue damage would appear quite different than it does.

At autopsy, the damaged scalp and neck tissues, for example, would show contusions, abrasions, or lacerations from the upper surfaces [outside the head] rather than simply be limited to damage originating from underneath [inside the head, so to speak]. What Dr. Sabow interprets as contusions [bruising] or abrasions [avulsing the skin] from viewing an autopsy photograph of the decedent's anterior neck and head on an autopsy block is merely surface blood, post-mortem lividity, or an artifact introduced by the neck block itself as it is commonly used to support a decedent's head during the autopsy surgery. So no soft tissue injuries support the view that the decedent sustained a blow to the back of his head prior to the fatal shot gun discharge into his mouth. No evidence exists to support the view that the decedent suffered a 'depressed' skull fracture in the proper medical sense of that term.

Examples of depressed skull fractures include fractures resulting from falls against hard objects, or blunt force trauma from blows struck by objects such as bats, hammers, etc. An "eggshell" or a "displaced skull fracture, however, lacks such a directional implication, although many displaced skull fractures can be the result of force vectors from the outside surface inward such as high-power bullets as in the JFK assassination.[3]

[3] J. J. Humes, MD, hospital pathologist and administrator at Bethesda Navel Hospital describes the President's skull as being fragmented with the bones held together only by the surrounding soft tissues. In

However, Col. Sabow's skull fractures are not "depressed skull fractures" in that larger implied sense: there is no evidence that they were produced by forces applied from outside the surface of the skull pushing inward, thereby fracturing the skull and depressing the bone. The x-ray evidence merely shows a series of linear fractures with some bones held in place or together only by soft tissues thus allowing displacement whenever the head is moved without regard for these fractures.

The decedent also suffered fractures of the mandible and fractures of the maxilla as a result of the shotgun's discharge in his mouth. As seen in the video tape, when such a weapon fires, it "kicks back" following basic physics: any action has an equal and opposite reaction. When such a weapon is discharged in the mouth, the resulting forces act both on the shells contents [ammunition] and on the weapon itself. Thus the barrel of the gun produces injuries just as the discharged ammunition produces injuries [see below].

In addition, on the remaining x-ray data of the lower body, I observed radio opaque items in the groin area called phleboliths – *phlebo* = vein; *lith* = calcification – these are observed in the decedent's groin area as radio opaque stone-like spheres on x-rays. They are common in males of the decedent's age and are not significant or relevant to this inquiry. They should not be confused with shot shell pellets as seen in the x-rays of the decedent's head.

Autopsy: Photographic Hard Data

Soft tissue injuries: Swelling behind the victim's right ear & possible blunt force trauma

Head: Col. Sabow's death resulted from massive cerebral contusions and lacerations in turn resulting from a shotgun wound to the head, entering via the mouth. The weapon discharged into his mouth fired a 12 gauge Winchester brand "dove and quail" bird shot shell which is not considered to be an extremely powerful load given the small size of the bird shot [with about 352 pellets equaling 1 oz.] and the small volume of powder [less than 3 drams] in the 2 ¾" shot shell.[4] Consequently, and not surprisingly, there was no exit wound in the head. The round scattered bird shot throughout the brain and head; the rapidly expanding gasses produced by the explosion damaged the soft tissue as well as providing the pressure fracturing the skull as noted at autopsy.

The autopsy photographs show that the body sustained no other injuries than those resulting from the shot gun wound into the mouth. No contusions, abrasions, lacerations or sharp-force injuries appear on any body surface. It is useful to review the area mentioned by Dr. Sabow as "evidence" that Col. Sabow was struck by a blow to the back of the head prior to being shot. This area appears in at least three of the autopsy photos:

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fact in one autopsy photo, he is shown holding the bones together via the scalp tissues in order to help approximate the shape of an intact skull.

[4] The Winchester "Dove & Quail" shot shell is designed to scatter 'birdshot' in front of the target. This allows the bird to fly into the cluster thereby striking at least some of the scattered shot. The hunter's goal is not to destroy the target, but simply to bring down the bird with as little damage as possible.

This view of the decedent's posterior aspect shows post-mortem lividity, as well as dried blood which came from the right ear as he lay on his right side after the injury: the decedent had been lying on his right side after the fatal shot until his head was moved when he was discovered by his wife. It was not indicated whether the lividity was fixed or not at this point. [Fixed lividity means that the *heme from the hemoglobin*, or red protein in the blood, separates from the rest of the fluid components when the heart stops mixing it up by beating, and it permanently stains the surrounding tissues after some period of time, usually 8 to 12 hours depending upon environmental and other factors.

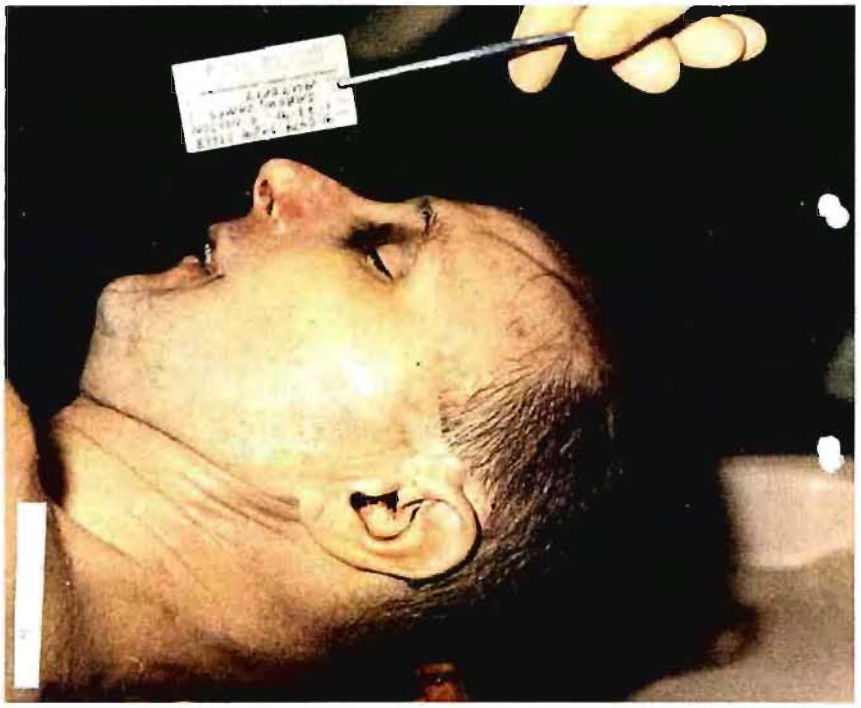
When lividity is not fixed, it will 'blanch' to the touch by being pushed away from the tissues, similar to a sun burn. When fixed, it cannot be so pushed away but remains a permanent stain]. The blanched or white areas around the lividity show where pressure was applied by the body's weight onto some surface preventing the deposition of heme in the tissues but allowing it in the surrounding tissues.

Dr. Sabow may have seen the above photograph without benefit of any explanation and without benefit of any of the other autopsy photographs [?]. It might seem to anyone unfamiliar with the appearance of dead human bodies and unfamiliar with the injuries sustained by this decedent that the red area around the right ear could be the result of blunt force trauma. However this is not the case. The red material is washed away in the next photograph leaving only dependent lividity resulting from lying on the right side. The swelling visible beneath the right ear results from the skull fractures described by Dr. Singhania as well as from the soft tissue injuries sustained from the shotgun discharge into the mouth. The many fragments of skull bone from the destroyed brain pan 'sag' and can be seen to present localized "swelling" depending upon the body's position. We can see this in subsequent photos of both the decedent's left and right sides.

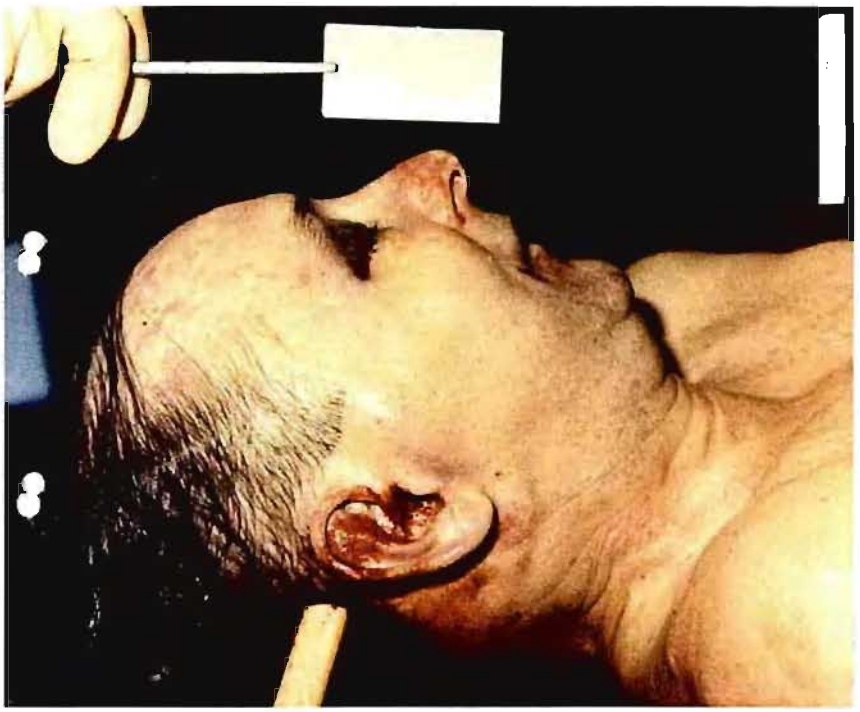
This autopsy view shows that post mortem lividity as described above, apparently after washing the body and removing the remaining dried blood from the back of the neck and below the right ear. The lividity appears in the mid-back area and above the shoulder blades as well as on the right side of the neck, and below the scalp hair. The *heme* is deposited in dependent areas given the body's position after the hear stops beating. This is known as positional, dependent, or gravitational lividity.

Clearly here there is no evidence of injury on the right side of the neck below the right ear. Again, the swelling observed is a result of the displaced skull fractures and the soft tissue injuries which are in turn the result of the shot gun discharge into the decedent's mouth. No soft tissue injuries support the view that the decedent was struck a blow to the back of the head or to the area below the right ear. There are no soft tissue injuries which have their origin from outside of the skull or from the outside surface of the surrounding tissues.

The head block can be seen supporting the decedent's head on the right ear. The position of the head block also puts pressure on the displaced skull fractures affecting the ultimate shape of the skull by allowing the fractured margins to move underneath the supporting tissues.



This view also shows the displaced skull fractures. The neck appears swollen below the left ear toward the shoulders. This results from bleeding originating beneath the epidermal tissues as well as from the displaced skull bones. It appears on both the right and the left, and given the condition of the skull, the surfaces may be palpated and maneuvered into alternate positions.



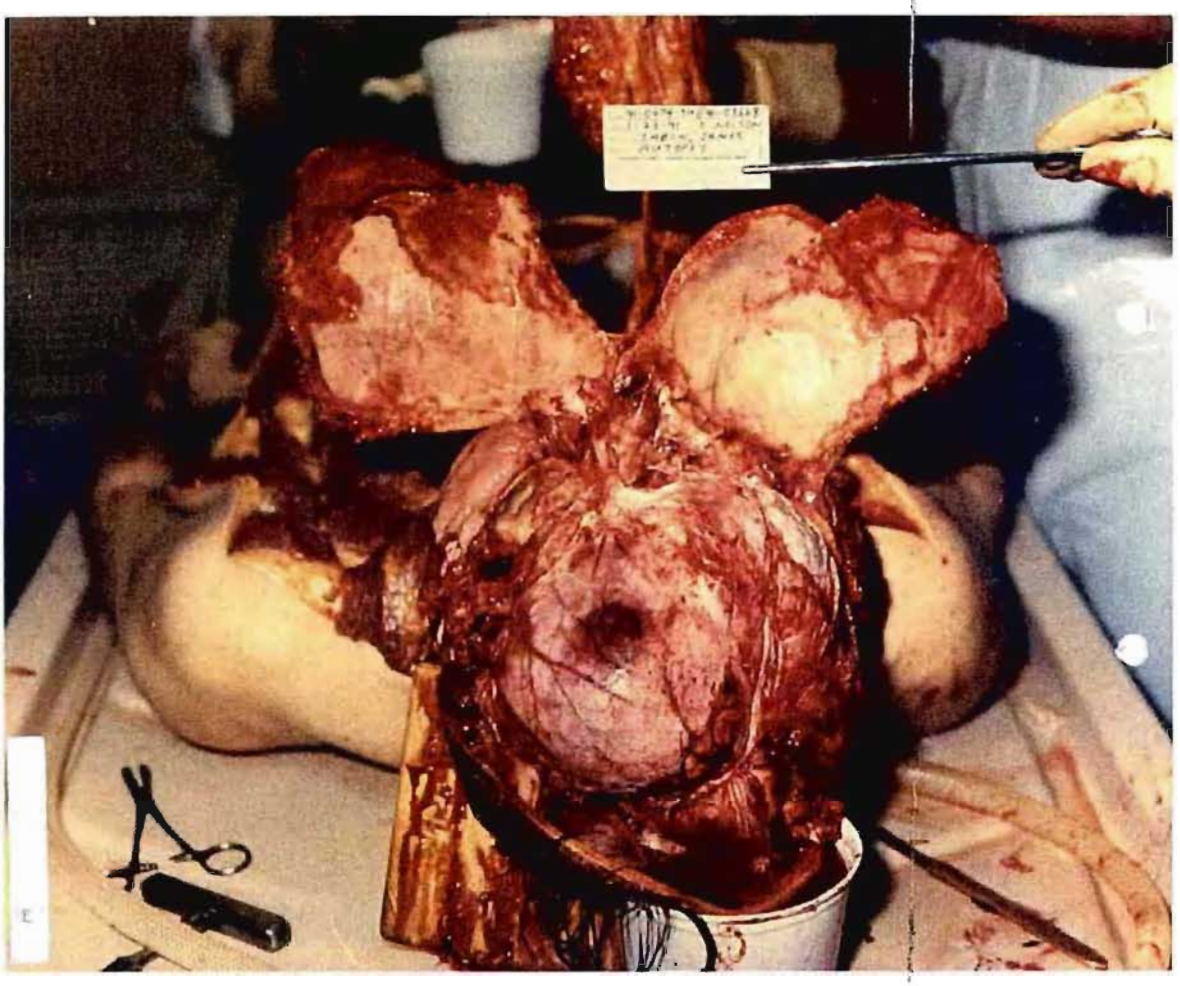
This view also shows the displaced skull fractures and the bleeding from the right ear. The blood appears below the right ear and toward the neck. This is not blood which

results from additional blunt force trauma applied to the decedent's head before the fatal shot gun discharge. Note the neck block as it contributes to the shape of the head and neck by providing pressure on the fractured skull.

No external injury is required to explain the swelling of the decedent's skull and the bleeding beneath the right ear. As the following photo demonstrates, only soft tissues hold the badly fractured skull together.

The shotgun blast produced linear fractures as seen in both the x-rays of the skull and in this photograph after reflection of the scalp at autopsy. It remains apparent that these eggshell fractures articulate only when held together with soft tissues. One can see that

the severe fractures toward the rear of the skull have allowed the brain and associated hemorrhage to appear through the displaced bone.



With the scalp and face reflected, the larger elements of the fractured skull easily separate as seen above.

A study of these injuries must fit together with a study of the weapon producing those injuries. From the nature of the injuries sustained, the original position of the body when first discovered, the bloodstain patterns outside the body, the bleeding inside the body, and the presence or absence of gun shot residues on the body, the position of the victim and the position of the weapon when the discharge occurred can be determined. To this end I analyzed the next piece of hard evidence: the weapon.

The Weapon: Hard Evidence

The original weapon was recovered at the scene of Col. Sabow's death. After the weapon was no longer needed by the investigative agencies involved in the investigation of Col. Sabow's death, the weapon was released to the family. Possession was assumed by Dr. David Sabow.

In a letter sent to Dr. David Sabow dated August 10, 2004, I requesting delivery of the Ithaca shot gun recovered beside his brother's body in 1991 [see Appendix III for a copy]. I explained my reasons both to examine and to test the weapon in the *Final Analysis Forensics* Laboratory. In the absence of an affirmative reply and with no delivery of the weapon for this testing, I was forced to find and purchase a similar weapon to stand in for the 200E Ithaca side-by-side shotgun with the appropriate choke. And for purposes of this testing, I purchased 12 gauge Winchester "Game Load" shot shells to stand in for the Winchester "Dove & Quail" shot shells which are no longer manufactured.

Since I did not examine the original weapon, I can provide no functional analysis of its condition. However, I can describe the weapon's class characteristics and general features. These features remain relevant to a clear understanding of Col. Sabow's injuries and death. One significant issue regarding the weapon remains the functional fit of the breech when closed which results in GSR discharge on the shooter's hands. Another significant issue concerns the behavior of the bird shot given its propellant charge when fired into a dressed stand-in for the decedent. The questions to be asked and answered concern the bloodstain patterns on the clothing and the hands of the shooter, the force of the discharge and its effect on internal bleeding within the decedent's body, and the question of whether the decedent could have been shot when lying prone.

Summary of Weapon & Cartridge Testing Data

Weapon: Scientific Testing

The Ithaca model 200E 12 gauge double barrel side-by-side shotgun, serial # 137911, was not provided by Dr. Sabow for testing and examination, despite repeated requests. Nor was he willing or able to provide any remaining ammunition from the box containing the fatal round. Winchester Dove & Quail 3 ¼ - 1 – 7 ½ load 12 gauge birdshot load shot shell ammunition is no longer manufactured by that name. As stated, Winchester now calls the relevantly similar ammunition currently manufactured "Game load."

Specifications

Without the original weapon, or helpful information from Dr. Sabow, I had to research the relevant barrel properties of the model 200E Ithaca involved in Col. Sabow's death. Research determined that if the NIS measurements and serial number documentations were correct, then the relevant Model 200E Ithaca was manufactured sometime between the late 1970's and the mid 1980's by SKB in Japan.[5] The weapon had a 2 ¾" chamber [meaning only that the shot shells could be 2 ¾" long but no longer], a 26" barrel length, a **'Modified Choke'** in the left barrel and an **'Improved Cylinder'** in the right barrel [meaning that the left barrel size was constricted by .020" called a *half choke*, in order to keep the pellets flying closer together for a longer distance; the right barrel size was constricted by .010" called a *quarter choke*, in order to keep the pellets flying closer together but for a shorter distance than the *half choke*, allowing them to spread sooner than the left barrel]. The weapon also had a single trigger, with a barrel selector trigger

[5] I contacted Ithaca Gun Company for confirmation and additional data which they faxed to me. The materials are attached in Appendix III for reference.

switch incorporating the safety allowing the shooter to select barrels for appropriate range and target. The gun was designed mainly for bird hunting or skeet shooting. The relevant properties of the weapon for my testing purposes were its barrel configuration, breach style, trigger mechanism, and length.

Finding a similar Ithaca Model 200E shotgun proved extremely difficult. When available, examples were mostly antique versions of the weapon with Damascus steel barrels designed for black powder shooting, not for today's smokeless powder shot shells. The antique version sported dual triggers, one for each barrel rather than the barrel selector switch-safety mechanism found on the reproduction 200E from the 1980's. Cost and availability proved to be impossible hurtles.[6] However, further research showed that the same barrel configuration, breach style, trigger mechanism and length were available in a side-by side shotgun manufactured in Spain by American Arms in the 1970's – the American Arms "Gentry."

This shotgun has relevant features identical with the features of the Ithaca 200E, except that the "Gentry" has a 3" chamber [meaning only that the shot shells *could* be up to 3" long, but that the breach will accommodate 2 ¾" shells too, as the Ithaca does]. Like the Ithaca 200E, it too has a 26" barrel length, a 'Modified Choke' in the left barrel and an 'Improved Cylinder' in the right barrel [meaning that the left barrel size was constricted by .020" called a *half choke*, in order to keep the pellets flying closer together for a longer distance; the right barrel size was constricted by .010" called a *quarter choke*, in order to keep the pellets flying closer together but for a shorter distance than the *half choke*, allowing them to spread sooner than the left barrel].

The weapon also has a single trigger, with a barrel selector trigger switch incorporating the safety allowing the shooter to select barrels for appropriate range and target. This gun was also designed mainly for bird hunting or skeet shooting and is considered by collectors and weapon historians to be a copy of the Ithaca style weapon.

I purchased an American Arms "Gentry" side-by-side shotgun serial # 504614 for 895.00 for purposes of this testing. For this testing, I also relied upon approximate measurements of the body provided by Naval Investigative Service, documented in "Examination of Victim at Crime Scene and at Coroner's Facility," recorded 22JAN91-11ET-0021-7HMA on page 4 of 6 [measured by SA; with a non-scale drawing and measurements of the decedent at the scene – 5153 'F' Street, Irvine CA, both reproduced on page 5 of 6, also rendered by SA].

(Please see my comments, Part Three, regarding errors in scene documentation and measurements recorded below.)

[6] Examples ranged from $3000.00 on up with some apparent bargains available on the internet, but with antiques, the testing would not be with a relevantly similar weapon given differences in barrel materials, triggering, and choke. It remains dubious purchasing such items sight unseen on the internet. Often what appears to be too good to be true turns out to be exactly that: no bargain after all.

Approximate Measurements of Weapons
Ithaca Model 200E & American Arms "Gentry" double-barrel shot guns

A. As listed by Naval Investigative Services the Ithaca Model 200E used in death:

1. Muzzle to trigger: 28 ¼"
2. Muzzle to trigger pulled to point of fire: 28 ½"
3. Muzzle to butt: 34 ¾" [**ERROR in measurement**]

B. As researched by *Final Analysis Forensics* with information provided by the Ithaca Gun Company concerning the Ithaca Model 200E used in death:

4. Muzzle to trigger: 28 ¼"
5. Muzzle to trigger pulled to point of fire: 28 ½"
6. Muzzle to butt: **44 1/8" is corrected measurement** per Ithaca Gun Company data

C. American Arms "Gentry used by *Final Analysis Forensics* for testing

7. Muzzle to trigger: 28 7/16"
8. Muzzle to trigger pulled to point of fire: 28 ¾ "
9. Muzzle to butt: 44 3/8 "

Approximate Measurements – Decedent

10. Mouth to the tip of right thumb: 35 ¼"
11. Mouth to the tip of right index finger: 36 ½"
12. Mouth to the tip of left thumb: 35 ½"
13. Mouth to the web of left thumb and left index finger: 35"
14. Mouth to the tip of left index finger: 37"
15. Right inner elbow to tip of right thumb: 15 ½"
16. Left inner elbow to tip of left thumb: 15"

These measurements show that the dimensions of the weapon and the length of the decedent's arms and his overall size allow for the possibility of a self-inflicted wound. A coworker was exactly 71" tall, the same size as the decedent, and from his mouth to the tip of his right thumb also measured 35 ¼" with each of the other measurements relevantly similar to within 1/4" of the NIS measurements.

We used these measurements when seated on a chair about 17" off the ground in order to construct our models for testing the issues raised above concerning bloodstain patterns, the behavior of the weapon when firing the "game load" birdshot and for testing what differences if any would be present at the scene if the decedent were shot lying down vs. if the decedent were shot while seated on a chair leaning forward 'into' the shotgun. The models were constructed as described below. The following photo illustrates the model position used for the decedent seated on a lawn-type chair.

Given the physical evidence available, it appears that the decedent held the barrel of the shot gun with his left hand, and used his right hand/fingers to activate the trigger which fired the left barrel. It should be noted here that the issue of the barrel's choke, that is the left barrel being a half-choke and the right barrel being a quarter-choke, remains largely irrelevant for a contact or a near-contact shot gun wound. Choke only comes into play when the pellets have an opportunity to fly for some distance. For example, at 10 yards a barrel with a half-choke [modified] will allow pellets to spread to a diameter of about 12 inches while a barrel with a quarter-choke [improved cylinder] will allow the same pellets fired from the same size shell to spread to a diameter of about15 inches. At 40 yards, the modified barrel pellets spread to 46 inches while the improved cylinder pellets spread to about 51 inches. At contact or near contact, the difference between the two chokes is irrelevant.

Trace Evidence on Col. Sabow's Hands: Blood and GSR

GSR Found on Col. Sabow's Left Hand

The presence or absence of GSR [correctly meaning both burned and unburned gunpowder, primer residues and associated muzzle effluents] has long been considered of marginal value for the detection and subsequent identification of *living shooters*. GSR *can* persist on skin under certain conditions, but it is easily removed via washing, wiping, and everyday actions such as shaking hands, touching materials, or even holding objects in the hands. Of much more interest is the presence of any GSR on the clothing of *living suspects* – more specifically, the patterns of GSR, if identifiable, on the clothing. This data may at the very least indicate that the clothing was in the near vicinity of a fire arm's

discharge. The patterns may allow additional interpretations under certain appropriate conditions.

These appropriate conditions include the detection of GSR on deceased victims who obviously lack both ability and opportunity to remove GSR after a weapon's discharge in the above manners. The presence of both GSR and weapon-specific blood staining [and voids] is often considered definitive evidence to support a finding of death by self-inflicting gun shot wound. Such evidence exists in the death of Col. Sabow.

Finding of GSR

Testing reported in the provided documentation of Col. Sabow's death showed GSR present on Col. Sabow's left hand. The photos of his left hand, as developed by Final Analysis Forensics, also show the apparent fouling on the decedent's left hand with bloodstains [addressed later]. This appears to support the conclusion that Col. Sabow held the weapon's barrel in his left hand, with his hand up to his mouth, when the weapon discharged. In this scenario, he would have used his right hand to activate the trigger if this is a self-inflicted gunshot wound. The report indicates that ***no*** GSR was detected on Col. Sabow's right hand. This is potentially somewhat surprising, but is dependent on the behavior and condition of the specific Ithaca shotgun used to fire the fatal shot shell.

This photograph shows the web of the decedent's left hand. The black area appears to be fouling from the discharge of the shotgun near the hand, placing the hand near the end of the shotgun's barrel at the time of discharge. [This positioning also explains the blood on the left hand, later described below as replicated in our testing. See video of tests on CDs

and the other testing photos which replicated this finding which are attached to this report.]

The above photograph shows apparent fouling from the weapon's discharge on the inner aspect of the left thumb, confirming visually the positive laboratory finding of gunshot residues on the left hand. Note, however, photographic documentation of the right hand is absent: an error in crime scene documentation or major proportion. All we have is the statement that no gun shot residues were found on the right hand.

Again, that may or may not be significant. However, in a solid investigation, data is collected which will allow investigators to revisit the case even years later with new questions. If no photos were taken of the right hand, and if samples are not retained, it is difficult for me to answer a question today about how the right hand appears when compared with the left. And without the actual Ithaca shotgun, it is impossible to test for breach block leakage in order to determine if the finding of no gun shot residues on the decedent's right hand has any significance whatever.

Testing

The only relevant testing *of this lack of GSR* on Col. Sabow's right hand ***must involve the identical weapon, the Ithaca Model 200E serial # 137911*** used in the Col.'s death. However, Dr. D. Sabow would not provide that weapon for testing, stating that he believed that this testing "was not relevant." This betrays a significant lack of forensic training and experience. Nothing could be further from the truth. Such tests would need to measure any breach block leakage of primer and gunpowder residues as well as any barrel blow-back during the detonation of a round from the weapon's left barrel. The

issue bears on the position of the right hand, and might help answer the question "If Col. Sabow fired the weapon, how did he do it? Or if significant GSR (gun shot residue) leaks from the shotgun at the breach and trigger, and if Col. Sabow had ***none*** on his right hand, then someone else fired the weapon." I would not call this irrelevant to the investigation.

If the weapon was found to leak GSR from its breach when fired due to wear, age, or the weapon's design, then any shooter firing the weapon with his hand near the trigger/breach should have GSR present on the hand used to pull the trigger. However, even if this is case when holding the weapon as it is designed to be discharged, the results may be very different when *pushing* rather than *pulling* the trigger with the hand and arm coming from the barrel's direction rather than from the stock's direction. That again underscores the importance of actual testing rather than simple speculation. Science demands testing and experiment whenever such efforts will help answer pressing questions, or help confirm or refute inferences from other evidence. Unfortunately Dr. Sabow does not understand the issues well enough to grasp this fact regarding tests of the shotgun.

Regardless, their must be some explanation for the lack of GSR on Col. Sabow's right hand. Contrary to Dr. Sabow's beliefs, this experiment could provide significant evidence concerning an explanation for the absence of GSR on Col. Sabow's right. It appears somewhat ironic that a man so desperate for evidence to prove that his brother did not commit suicide would, apparently from his own hubris, dismiss one of the most common forensic tests which could shed light on the role of the decedent's right hand in the shooting as "not relevant." I would hope that if the family understood the importance of this fact, that whatever grief is involved in sending the shotgun to the laboratory would be balanced by the hope that additional information would help settle the issues in this case once and for all.

Recognizing that this test requires the original weapon, I never-the-less tested the American Arms "Gentry" for GSR deposition on the shooters right hand firing the weapon from both directions. If nothing else, the test may provide some insight into any *general features* shared among 26" double-barrel shotguns of similar design. However, this in no way replaces testing with the original weapon. [The results of this and other GSR testing from EDX will not be available by the time this report is due November 8, 2004. As stated earlier, supplemental reports will be provided if requested]

GSR- Right hand breach/trigger leakage test: American Arms Gentry 12 gauge Shotgun Serial # 504614

Materials:

- 2 pair white cotton gloves sealed in plastic
- D-lead Deluxe Whole Body Wash and Shampoo by ESCA tech, Inc. Milwaukee WI (for removal of heavy metals such as arsenic, cadmium, chromium, lead, mercury, silver and zinc.
- Four Winchester "Game Load" shot shells
- American Arms "Gentry" shot gun

- Rubber gloves
- Plastic evidence bags
- Marking pen
- Assistant
- Shooter

Method:

1. Shooter's face, both hands and both arms are washed with D-Lead; the shotgun is wiped with D-Lead and cleaned, including barrel, barrel support, trigger, trigger guard, and stock. Assistant loads shotgun wearing rubber gloves, closing the breach and placing the shotgun on clean lab paper over bench. Assistant changes gloves; opens sealed cotton gloves allowing shooter's clean hands to reach cotton gloves and put them on. Shooter picks up shotgun wearing cotton gloves.
   Conventional Direction:
2. Holding weapon conventionally, shooter fires left barrel with right hand on trigger.
3. Shooter places weapon on paper, assistant changes gloves and removes shooter's left hand glove putting it into a separate evidence bag; assistant changes gloves and removes shooter's right hand glove placing it into another evidence bag. Both bags are marked for testing.

4. Protocols are repeated for the right barrel.
5. Analytical testing will be completed by EDX [can not be completed in time for this report].
   Reverse Direction:
6. The test is then repeated with the weapon placed in a shooting clamp [see photographs of clamp], allowing the shooter to fire the left barrel with right hand by pushing the trigger while standing on the weapon's right side facing the butt end rather than by pulling the trigger in the conventional manner.

7. Protocols are repeated for the right barrel.
8. Analytical testing will be completed by EDX [can not be completed in time for this report – supplemental report will be provided if requested].

The noise and power of the Winchester 12 gauge "dove and quail" shotgun shell

Testing for sound and power:

One question raised in Dr. Sabow's investigation concerns the possibility that someone certainly would have heard a 12 gauge shotgun discharge in the back yard of a residential area. To this end, we tested the double barrel weapon by firing several different rounds into both paper and plywood targets at 8' distances. The photographs of the results are presented in Appendix III. Video of the testing also appears on the CD included with this report. It is sufficient here simply to summarize the results, letting both the photographs and the videos with their sound tracks speak for themselves.

When a 12 gauge shotgun is fired, the sound and destructive power depend completely upon the type of ammunition used. Of all the ammunition available for the 12 gauge, Winchester "dove and quail" or now so called "game load" is among the least powerful available. Of course "least powerful" is a relative term: least powerful when compared among other available 12 gauge rounds. It must also be noted that compared with standard center fire ***rifle ammunition***, shot gun shells generate relatively little power in terms of inter-barrel pressures.[7] We tested the following rounds:

The higher the number, say #7.5 or #9, the smaller the pellet; the smaller the pellet, the more pellets required to weigh 1 oz (or the specified weight of the projectiles – 7/8 oz up to 1 ½ oz.). A slug is a single large projectile used instead of pellets to inflict damage on certain kinds of targets such as large animals at very close range; some are rifled and some are not. They are designed to inflict maximum damage through penetration but only at a very close range.

So called "00" buck is also considered a heavy projectile with about 9 round balls for close range work. The dove and quail round discharged in the decedent's mouth is a number 7 ½ which means that about 383 pellets make up the 1 oz of shot fired by the shell. The round is not designed for powerful close range damage, but is designed for bringing down small birds such as dove or quail in flight while inflicting minimal damage on the target.

This does not imply, however, that the round's designed characteristics apply at close range or at contact or near contact with a target. Any round such as the Winchester game load, formerly called 'dove and quail,' will inflict damage according to the powder charge present in the shell and the characteristics of the projectiles present.

Listed from least loud to most sound [measured in decibels]

Winchester Game/Dove & Quail	394 pellets	
Winchester #9 – 1 oz	Target	least
Fiocchi #7 ½ - 1 oz	383 pellets	
Federal Cowboy black powder #8 – 7/8 oz		louder
Hornaday 12 gauge Slug – 1 large lead projectile		
Federal "00" Buck	9 pellets	
Winchester "4 Buck"	27 pellets	
Federal #4 – 1 1/8 oz	152 pellets	most

Each round has different sized projectiles and different powder charges. In this sense, the least powerful remain the Winchester Game, the Winchester Target, and the Fiocchi #7 ½

[7] These pressures are of considerable interest both to weapon designers and to reloaders who aim to put enough powder in their reloads to fire the bullet or the shot shell pellets powerfully, but not too much so as to explode the cartridge or shot shell in the barrel, or to explode the barrel itself. Several methods are used in ballistics to measure such pressures including piezoelectric gauges, copper crusher method, or the lead crusher method.

which is very similar to the Winchester Game, or the older "Dove and Quail" at issue in this case. The Federal Cowboy #8 was also slightly less powerful per unit of gun powder [dram equivalent] because modern smokeless powders have somewhat more energy per weight than the older black powder used in the old paper cowboy rounds. The cowboy round's black powder is measured in "***dram equivalents***" which is the accepted method of correlating relative velocities of shot shells loaded with smokeless propellant to shot shells loaded with black powder such as the cowboy load.

The major difference between black powder and modern smokeless powder is that the black powder requires external sources of oxygen to ignite while the modern powder has its own oxygen supply as part of the powder configuration. For that reason, reloaders who fire black powder shot shells often pack the powder too tightly thereby limiting the supply of ambient oxygen and lowering the explosive power of the shell.

The main conclusions demonstrated here can be summarized as follows:

1. That the Dove & Quail or Game Load has less power and less noise than the "00" Buck, or Federal #4 or any of the other rounds tested on a relative scale.
2. That the Dove & Quail or Game Load makes considerably less noise than the other more powerful 12 gauge loads on a relative scales.
3. That the weapon's left barrel held the pellets in a tighter grouping for the most part than the right barrel, consistent with the choke noted for each.
4. That at contact or near contact, degree of choke is irrelevant when considering damage inflicted on the target [see below for demonstrations].

Blood staining & Voids

With a better idea about the behavior of the 12 gauge when shooting Winchester Game load, or 'dove and quail' shot shells, the next group of questions concern the bloodstains found on the body and at the scene. To some extent, I hypothesized that the bloodstains produced would be dependent upon the power of the shot shell fired into the victim's mouth. Of course this is obviously correct if the shot shell has sufficient power to produce an exit wound, essentially blowing the victim's head apart at the scene.

In this event, then, we should expect to see the results of arterial spurting, etc. covering any clothing worn by the victim as well as any deposition of brain matter, skull, and tissue debris. Obviously we do not see such bloodstains in Col. Sabow's death. There is no exit wound. Therefore, testing is required to help determine from the injuries sustained, from the bloodstains present on the victim's bathrobe, head, and hands, and from his resting position at the scene, just what the victim's position was when the shotgun discharged.

If we can replicate the staining, then we have come a long way toward understanding the way in which Col. Sabow died. To do so, four tests were conducted. For these tests, skull boxes, or stand-ins for a human head were constructed, as well as a structure to replicate a 71" tall human form seated on a chair approximately 17" from the ground.

Testing Protocols & Method
Assumptions to be tested:

- If Col. Sabow was indeed seated when the shotgun discharged, as hypothesized in the above photograph of a 71" tall laboratory assistant, then we should be able to replicate the staining observed on the decedent's bathrobe, hands, and the shotgun.

- If Col. Sabow was shot by another person when lying in prone position, with the shotgun jammed past the 'gag reflex' hard into the surrounding tissues against bone as Dr. Sabow suggests, then testing that scenario should replicate the staining observed on the decedent's bathrobe, hands, and the shotgun.

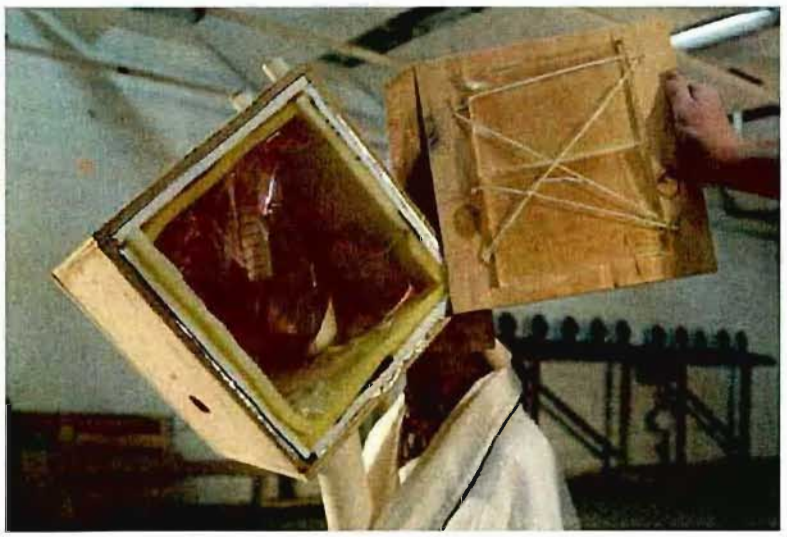
Testing Materials
Skull Boxes & their purpose:
Using ½" plywood, ½" foam, and ½" closed cell polystyrene insulation, a 12" by 12" skull box is constructed. The box is designed ONLY TO model the direction of energy discharged into the box [a human skull] and NOT TO model the fractures or damage done to the skull bone or to the skull itself. To this end, slices of ballistics gel are used as a functional equivalent to human tissue, and a series of plastic bags containing red colored fluid [colored for visibility only] are used to function as cerebral spinal fluid and blood. The fluid is NOT designed to replicate all the bleeding but simply to indicate, given the discharge of the weapon into the skull box, what the energy disbursed will do to the fluids and what course subsequent bleeding might follow given this disbursement, assuming that the skull box remains intact as Col. Sabow's skull did [not always the correct assumption, see below].

To this end, holes were drilled in the materials to represent the nose, mouth, and the bronchial tubes to the chest. [The ears were not considered in this experiment since the objective was to investigate ***only positional and force issues related to blood stains*** on the robe, the hands, into the thoracic cavity, and onto the weapon itself under these various conditions].

Materials
½" plywood, ½" foam, and ½" closed cell polystyrene insulation; 4 x 4 post; peer block saddles; 2 x 6 and misc. lumber stock; 1" steel pipe; 2" PVC pipe; 1 ½" PVC pipe; Sewing torso form; white terrycloth bathrobes, white t-shirts; white bed sheets; American Arms "Gentry" shotgun; Winchester Game Load; Federal #4 – 1 1/8 oz 152 pellets as the most common "powerful" 12 gauge load; poly line cord; eye hooks and misc. hardware for assembly.

The following illustrates the construction described:

The skull boxes are attached to two pipes by slip-brackets which allow the box some limited movement forward and back as well as up and down. The relative sizes of the entire model correspond with the measurements given of the decedent and the weapon. The placement of the weapon is approximate, but allows for the measurements derived in the NIS investigation. The size of the skull box is not meant to equal a human skull – it is designed to trap and to measure the effects of expanding gases from the weapon's discharge on materials standing in for brain, tissue, blood, and cerebral-spinal fluid. It is not designed to model skull fractures or to remain totally intact with different loads involved.

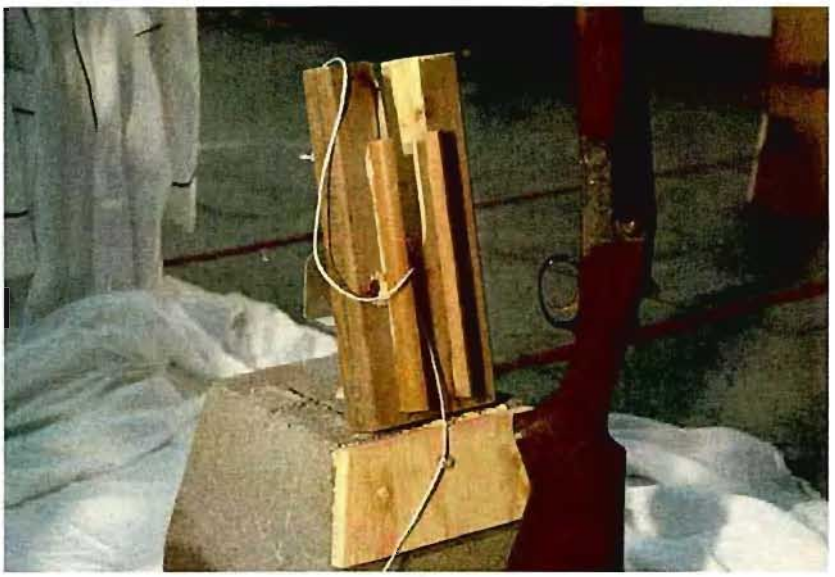


The boxes have two holes for the nose, one for the mouth designed to accommodate the shotgun, and one for the bronchial tubes leading to a plastic bag which stands in for the lungs. [The 2" outside diameter PVC pipe has a plastic bag taped to the end to collect fluids forced into the lungs down the bronchial tube.] Recall that the objective of these tests in simply to determine *what happens* when the energy is discharged into this space with respect to fluid movement and the associated stains on the clothing which was worn

by the decedent. These tests assume that the decedent sat on a chair about 17" from the ground, leaning into the shotgun as pictured.

The boxes contained ballistics gel [tested to FBI specifications as described] on the inside surface of each side as shown – with the skull boxes affixed to the 4 x 4 post, as seen below, the plastic bags were inserted and the sides screwed together with deck-style wood screws.

The PVC tube with affixed plastic bag was inserted beneath the bath robe which was put over the torso sewing form installed on the 4 x 4 post. The form was dressed first in a white t-shirt, and then in a white terry cloth bathrobe. When the skull box/clothing form was ready, the shotgun was affixed to another concrete peer block as seen below:



A 2 x 6 block was cut to accommodate the shot gun and trigger guard; a 'U' clamp was used to attach the shotgun to the block. Poly cord was configured using a slip-knot over

the trigger guard, and threaded through two eye hooks to enable the weapon to be fired from a safe distance.

Ends of the cord were melted to prevent fraying and to limit stretching when the shot gun was discharged. After preparations were complete, the weapon's barrels were opened as allowed by the cuts into the 2 x 6 and both barrels were loaded [done to replicate the actual weapon loaded in both barrels as used in Col. Sabow's death].

This view shows the configuration of skull box, weapon, and torso form with t-shirt present. The PVC tube was inserted under the bath robe – again, its only purpose was to detect the expanding energy within the boxed "system" after the discharge of a Winchester Dove & Quail (Game Load) shot gun shell.

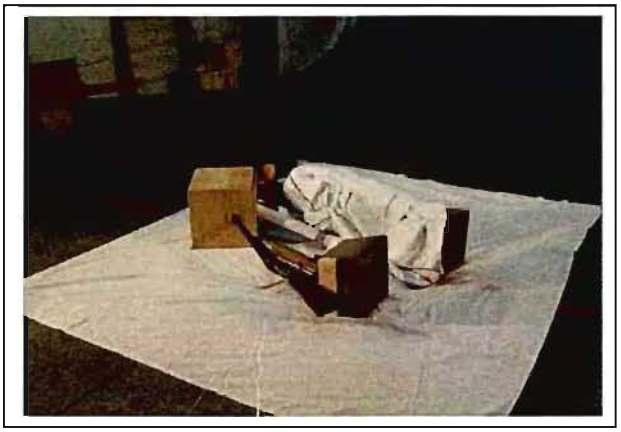
When the weapon was loaded, the barrels were inserted into the opening cut for the mouth. For one test, a white cotton towel was tied around the barrel near the mouth opening and muzzle to detect both bloodstains/fluids and GSR [the GSR testing via EDX will not be completed before the due date of this report.] The towel has been saved into evidence with the rest of the testing materials for further analysis should such analysis beyond EDX become necessary.

With the left barrel selected, the line was pulled from a safe distance discharging the left barrel during each of the tests.

Each view here shows the testing set up for two of the four tests: two tests were made with the above system vertical; two tests were made with the above system lying on its right side.

The system on its side replicates the above, enabling relevant similarities to remain constant with the only changes being the configuration's position. This allows relevant comparisons between the two vertical tests and the two horizontal tests.

Again, the PVC tube with the plastic bag is designed to capture the gases pushing materials down the trachea/esophagus and into the lungs, but does not involve the stomach. [Note the anatomical findings of the stomach at autopsy: "The stomach has a small amount of liquidy (sic), pinkish-brown gastric contents, with no solid food material." Autopsy Record, 91-00474-SU Page 4].



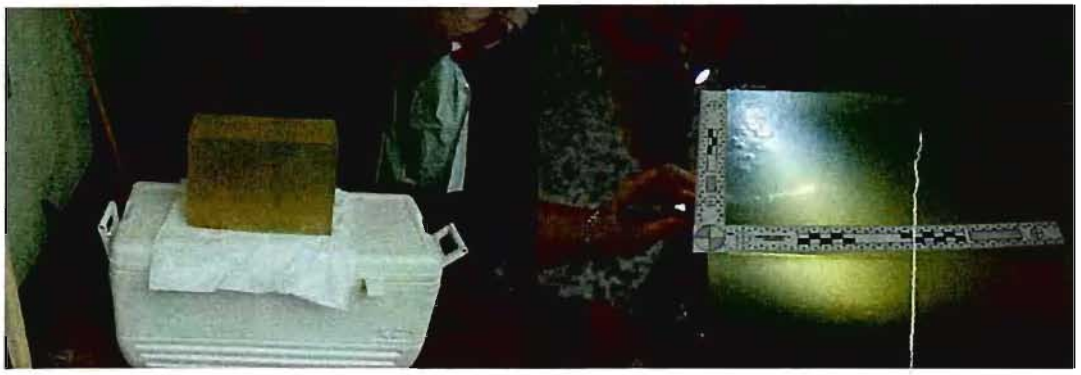
Configuration of the skull box remained identical in one test; however for the second prone test, the shot gun's barrel was jammed tightly against the ballistics gel inside the box rather than allowing some space as in the other tests. This test was designed to determine what would happen if, as according to one of Dr. Sabow's theories, the weapon were jammed into the decedent's mouth beyond the gag reflex before it was fired [rather than the damage beyond the gag reflex being an artifact of discharging the weapon].

Ballistics Gel Quality Test:

Dr. Martin Fackler, trauma surgeon and terminal ballistics investigator, helped develop protocols for testing ballistics gelatin to be sure that it appropriately stood for human muscle tissues. Ordnance gelatin is only a rough approximation for living muscle – penetration issues become significant with many types of ammunition, but penetration is not an issue in this case and is not *often* an issue with bird shot pellets fired from a shotgun – the issue investigated here with these models is only the behavior of the gases from discharge as their destructive power moves materials within the skull box toward exits provided: Col. Sabow did not suffer an exit wound thus penetration of the pellets is not a significant issue. The gel is used simply as a stand-in for human tissues and muscles of the head and neck, and not to help determine anything regarding penetration.

None-the-less, our gel was calibrated according to INS National Firearms Unit Protocols by firing a .177 caliber BB projectile at 600 feet per second as measured by a chronograph 3.5 inches into the ballistics gel at 10 feet from muzzle to gelatin block – the distance required to achieve 600 feet per second through the chronograph.

This is seen in summary form in the following two photos:



On the left, a whole gel block made in a standard large size ammunition container; On the right, the results of firing the .177 projectile into the gel at the stated distance with the stated muzzle velocity achieving the required penetration allowing calibration.

Testing Results:
Test #1 – vertical & seated

After the weapon's discharge with the Winchester Dove & Quail equivalent Game load, we noted that the sound was minimal: the weapon's discharge with a low pressure round such as any shot gun load [relative to high-pressure center fire rifles for example] into a closed environment such as a human mouth or a skull box makes the sound mute at best. It is not surprising that no one would have heard the actual discharge of the weapon when Col. Sabow was shot. In fact, it would be more surprising if the discharge were heard.

Test #1 Results Summary:

Almost no 'bloodstains' or stains from the red colored fluid in the plastic bags appeared on the robe after discharge: the only stains in fact appearing were the result of our testing on a concrete floor with the fluid running from out the mouth and nose openings onto the ground IN FRONT OF THE TORSO. These stains simply soaked into the draped bottom of the robe, an artifact of our testing limitations absent an exact conditions test [no human subjects volunteered for these tests]. So no stains appear on the robe. Some stains appear on the ground, and the majority of the fluid/gases which would have gone into the bronchial tubes [PVC] went on the ground in front of the model as the bottom of the skull box breached during the shell's explosion [see photos in Appendix III].

Satins appear on the towel wrapped around the muzzle as a stand-in for the decedent's left hand. Both red fluid and muzzle effluent appear on the towel in the same fashion as blood and muzzle effluent appear on the decedent's left hand. The towel is preserved for testing via EDX, but such testing will not be complete by the due date of this report.

This test shows that with the decedent leaning slightly forward, onto, or toward the shotgun, holding the muzzle with his left hand and pushing the trigger with his right hand that the same stain patterns would result as were found on the decedent. Also, the gas pressure sufficient to breach the wooden skull box would have pushed gases and fluid

into the decedent's lungs leaving the appearance of 'aspirated blood' which is merely blood having the appearance of air bubbles at autopsy.

Such bubbles could have resulted from multiple mechanisms, including breathing after injury [given pathology, stated below] or given the mechanical infusion of gases into the lung tissue which both causes hemorrhage as well as introduces gas into the liquid blood present as a result. Therefore, this testing situation produces results which appear to correspond point for point with the actual results observed in Col. Sabow's death. It is therefore possible for this scenario to have occurred. Thus, since it is possible that this scenario occurred, it remains a good candidate to explain the actual death of Col. Sabow.

Test #2 vertical & seated:

In this test we used a more powerful load than the actual Winchester Dove and Quail load actually used by the decedent. After the weapon's discharge with the Federal #4, we noted that the sound also minimal when compared with a discharge of the weapon in the open air: the weapon's discharge with a low pressure round such as any shot gun load [relative to high-pressure center fire rifles for example] into a closed environment such as a human mouth or a skull box makes the sound mute at best. Therefore, this supports the finding that it remains likely that no one would have heard the actual discharge of the weapon when Col. Sabow died. Recall that that load was even less powerful than the load used in this test. It remains true that it would be more surprising if the discharge were heard than if it were not heard under these conditions, unless a witness happened to be very nearby – within a few feet.

Test #2 Results Summary:

This ammunition perforated the skull box leaving an exit hole in the back. This could have happened with a more powerful load, and if the decedent would have suffered an exit wound, the appearance of the scene would have been quite different. As stated, there would have been arterial spurting, and other signs of the exit wound present.

Since our skull box was designed only to model the discharge of gasses, and since in the actual case, the decedent did not suffer an exit wound, we see in our model that again no 'bloodstains' or stains from the red colored fluid in the plastic bags appeared on the robe after discharge: the only stains in fact appearing were the result of our testing on a concrete floor with the fluid running from out the mouth and nose openings onto the ground IN FRONT OF THE TORSO. These stains simply soaked into the draped bottom of the robe, an artifact of our testing limitations absent an exact conditions test [no human subjects volunteered for these tests]. So again no stains appear on the robe. Some stains appear on the ground, and the majority of the fluid/gases which would have gone into the bronchial tubes [PVC] went on the ground in front of the model as the bottom of the skull box breached during the shell's explosion [see photos in Appendix III].

Despite the exit wound to the wooden skull box, this test also shows that with the decedent leaning slightly forward, onto, or toward the shotgun, holding the muzzle with

his left hand and pushing the trigger with his right hand that the same stain patterns would result as were found on the decedent. Since the wooden box is not designed to replicate actual skull injuries, no conclusions can be drawn concerning the possible effect of a more powerful load on the actual production of an exit wound.

However, the gas pressure sufficient to breach this wooden skull box would have pushed gases and fluid into the decedent's lungs leaving the appearance of 'aspirated blood' which is merely blood having the appearance of air bubbles at autopsy perhaps even if a more powerful round produced an exit wound. This we will not be able to determine from this rather limited test.

Again, such bubbles could have resulted from multiple mechanisms, including breathing after injury [given pathology, stated below] or given the mechanical infusion of gases into the lung tissue which both causes hemorrhage as well as introduces gas into the liquid blood present as a result.

Therefore, this testing situation produces results which appear to correspond point for point with the actual results observed in Col. Sabow's death, given the limitation of our assumptions and the limited nature of any need to account for the presence of an exit wound. It is therefore possible for this self-inflicted scenario to have occurred. Thus, since it is possible that this scenario occurred, it remains a good candidate to explain the actual death of Col. Sabow.

Test #3 horizontal & lying down

This test produced the most dramatic and destructive results. With the same set up described above lying on its right side, the weapon was pushed further into the skull box until it rested against the ballistics gel. This was done to replicate Dr. Sabow's scenario holding that Col. Sabow was disabled [somehow] and while lying unresponsive on his right side, someone forced the shotgun into his mouth past the gag reflex which would place it against hard and soft tissues in the head.

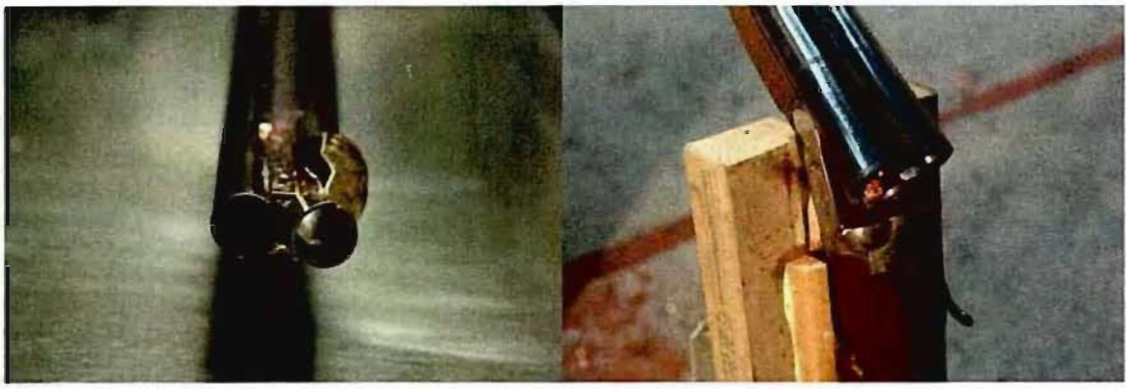
When the weapon was fired, very little sound resulted. What did result, however, was the destruction of the last 3 inches of the weapon's left barrel. When this type of weapon is held against a target which could completely seal the barrel ends, the explosion bursts the steel tube barrels. That is what happened in this test. Recall that a shot gun merely has steel tubes for barrels: they are not the robust rifled barrels present on handgun or long guns of other types. They are, therefore, considerably weaker than their rifled relatives. Recall the old cartoons of shotgun barrels pealing open like banana peels whenever their openings become obstructed. That happens in the real world.

Test #3 Results Summary:

Therefore, if the scenario Dr. Sabow proposes would have occurred, it is very likely that the shotgun would have been damaged in the same way that our testing showed: the

barrel would have exploded if the tight contact were made before the weapon's discharge. Since the shotgun recovered at the scene did not have a damaged barrel, one may conclude that this specific scenario did not happen in the death of Col. Sabow.

In this case, with the shotgun exploding, the round not only damaged the barrel, but also filled the right barrel with a plug of tissue (ballistics gel) as well as filling the both barrels with fluid. When the shooting device was stood up, the fluid ran out of the weapons barrels, as can be seen with the barrels open. When open, residues from inside the skull box made their way all the way to the shot shells and the breach. Since this was not observed in the actual weapon, there is every reason to believe that this scenario remains remote at best.



On the left, the damaged left barrel; on the right, the upright shotgun showing materials from the skull box sucked into the barrel after the shot shells' removal.

Required Gunsmith Work

In order to document the damage to the weapon sustained in Test #3, to view the tissues forced into the unfired right barrel, and to prepare for Test #4 (and any following tests not requiring an exact 26" barrel length), the damaged weapon had to be shortened by 3" to eliminate the split in the left barrel. This work falls within my training and experience. [The work is documented in photographs seen in Appendix III and on the CD.]

After repair, the weapon was tested (using all the sizes of 12 gauge ammunition as used on paper) in order to document any differences in choke or performance by shortening the barrel 3" after repair. Approximately the same relative differences appear between the left barrel with the half-choke and the right barrel with the quarter-choke – see photos and CD video of testing included in Appendix III.

Recall that the barrel's length has relevance only for the ability of the decedent to reach the trigger under a self-inflicted scenario – the injuries produced will not significantly differ when barrels with two different chokes are fired at contact or near contact range.

With these repairs accomplished, and after the testing by firing at plywood targets, the final test was completed as described below.

Test #4 horizontal & lying down

This test produced equally dramatic results regarding the bloodstains. With the same set up described above, the model lying on its right side, the weapon [now shorter by 3"] was discharged in the skull box as in the first two tests. (The shorter barrel length only has relevance for the decedent's ability to reach the trigger which is not adversely affected by this repair).

Again, even with the relatively tame dove & quail or game load Winchester round, our skull box was breached. However, recalling the nature of the skull-torso models and the built-in limitations they hold, the blood exiting from the mouth and nose would have probably struck the person or persons firing the weapon, thus creating voids not noted in the crime scene video [agents appear to be pointing to bloodstains in the grass, and over a wide range of grassy areas and are heard commenting about them on the video tape].

In addition, the bloodstain patterns differ from the patterns observed in the first two tests. In this case, the round shredded the plastic bag filled with the colored fluid, and it became clear that more fluid appears around the head than when the model was in a vertical position. It is important to note that in this test, more stains appear on the upper portion of the bathrobe and on the t-shirt. These appear to be due to the proximity of the ground with the fluid exiting from the nose and mouth and the resulting satellite spatter striking the clothing.

Test #4 Results Summary:

If we adopt Dr. Sabow's scenario that the decedent was prone, lying on his right side when someone shot him in the mouth, then we would expect to see more bloodstains on the decedent's upper torso, probably as a result of satellite spatter from striking the ground and striking the shooter himself or herself. Further, we would expect to find voids in the area before the decedent where the shooter stood, or knelt. We do not see such bloodstains on the decedent's actual robe. Such voids do not appear in the scene video as described by observers heard commenting about blood evidence on the scene video tape's audio track. Therefore, there is no evidence to support the claim that the decedent was disabled and lying prone when the shotgun was discharged into his mouth. In fact, contrary evidence suggests that this hypothesis proposed by Dr. Sabow is false.

Given the visible stains on the clothing as seen in the video tape, the question becomes "what explains these stains?" More specifically, is Dr. J. David Sabow's explanation that the blood on his brother's left hand *could come only from* the victim being shot with the shot gun by another person while lying prone on the ground true? These tests show that Dr. Sabow's explanation does not work to explain these, or any of the visible stains.

Bloodstain Patterns: Left Arm

The stains here were deposited with the blood moving from the hand toward the elbow – the two stains at the proximal end of the stains [toward the elbow from the hand] show directionality as does the larger stain. This hand was near the decedent's mouth when the muzzle blast occurred –this stain occurred with the hand in this position as confirmed by the finding of GSR and the soot-like fowling visible in the other photographs of the hand.

The stains visible in this view also show gravitational movement from the medial toward the lateral as seen by blood flow lines. Clearly blood does not run uphill. These stains are

the result of gravity, showing that the arm/wrist lay with the medial side of the left arm up and the lateral side down.

This can be seen as true in the scene video as well as in the still photos taken of the body in the back yard. This is explained by the fact that after/very shortly after the stains were deposited by the shotgun's discharge, the body fell from a vertical position onto the ground while the blood was still wet on the left arm.

Therefore, any claim that the bloodstains on the left arm are only possible if deposited with the body in a prone position is simply not true: the arm had to be upright, meaning that the hand had to be above the elbow, and then the arm had to be level with the medial side up and the lateral side down. Otherwise, the stains make no sense.

Therefore, none of Dr. Sabow's hypotheses stand up to even the most basic, simple testing scenarios with the models used above.

Fingerprints

Considerable effort went into studying the issue of fingerprints, or more notably, the lack of fingerprints found on the Ithaca shotgun involved in Col. Sabow's death. It was also reported that no fingerprints were found on the shot shells loaded into the weapon. As described below, the meaning of this claim is somewhat ambiguous and in reports this ambiguity is a source of error.

Generally, it is seldom possible to lift useful fingerprints from weapons involved in crimes. Success is usually more common on crime dramas than in real life crime fighting forensics. First, the surfaces do not lend themselves to print preservation [wood and diamond cuts in stocks, handles, and engraving on metal etc. as found on this weapon for example]. Also, on the barrel, a dried hand absent sweat and oils plus a clean, non-oily weapon will almost guarantee the absence of useful prints. More likely, however, the discharge of a weapon will smear existing prints and render the latent prints of little value. Without proper documentation of the finger print report, deciding the truth about the actual prints in this case becomes mere speculation.

Testing:
Several experiments were devised for making and lifting potential fingerprints from our test shotgun and the test shot shells. The major caveat to such experiments, however, rests in the old adage that 'absence of proof is not necessarily proof of absence.'

The test subject showered, shaved, and used alcohol based aftershave. He loaded the shotgun with discharged, cleaned shot shells, and carried the weapon to a chair by using the stock, and by supporting the weapon under his right arm and over his right forearm with the barrel open. He then closed the barrel in the conventional manner, and held the weapon's barrel with his left hand, moving his right hand to the trigger. He touched the trigger, and slid his hand down the barrel letting go of the weapon.

The weapon was picked up using rubber gloves. The gun was dusted with *Greenwhop* fingerprint powder from Lightning Powder Company. In a darkened room, a 320 nm UV light was shined on the powdered barrel, stock, and trigger/trigger guard. No identifiable prints were recovered. Several smears appeared on the barrel.

The powder was also applied to the cartridge cases or shot shells. No results were obtained using the above method.

It is difficult to reach any scientifically meaningful conclusion from the above test. All it shows it that it is *possible* to handle a weapon without leaving identifiable finger prints: we know that because we just did it. The exact application of the test results to the actual case, however, remains more problematic. All that can be said is that in the fingerprint report, some ambiguity exists in the terminology used and the results described.

Summary Conclusions: Part II

The testing detailed above and visible in the photographs in Appendix III and on the attached CD allows us to conclude the following, based both upon the tests and the scene documentation's hard data from the original investigation as detailed in Part Two:

1. The decedent was seated, and leaning forward when the shotgun discharged into his open mouth

   This must be true to account for the lack of bloodstains on the robe and his upper torso as well as the bloodstains on his left arm.

2. The decedent's left hand supporting the gun's barrel and his right hand probably pushed the trigger firing the left barrel

   This must be true to account for the GSR and blood on the left hand and what little we can see of the two small stains on the decedent's right hand.

3. The decedent's resting position, lying on his right side on the ground, results from the simple physics involved when a body falls in the direction indicated by the position of its center of mass – [leaning forward in this instance]. This might also help explain some of the injuries to the throat
4. There is no evidence that the decedent suffered any other injuries than those produced by the shotgun's discharge into his mouth.
5. There is no evidence that another person was involved in the shotgun's discharge: in fact there is evidence which counts against the involvement of another person

   No obvious voids appear in the grassy area in front of the decedent, and no bloodstains appear on the front upper area of the t-shirt or bathrobe which would be expected if the shotgun were fired by another person standing near the trigger with the weapon inserted into the Col.'s mouth.

6. While testing shows that it is possible to accomplish loading, holding and dry-firing the weapon without leaving *identifiable* prints, the Sabow case fingerprint report is ambiguous, and no testing can resolve a report's ambiguity

Pressure Studies: Shot gun discharge gas volumes and pressures

Aspirated blood:

One way experimentally to address concerns about so called "aspirated blood" in the decedent's lungs is to conduct a study to determine the volume of gas produced when a Winchester 'game load' 7 ½ -1- 2 ¾ shot shell is discharged. While this sounds relatively simple, nothing could be further from the scientific truth. The effort is to learn how much gas is released by the shell's explosion. Yet as we all know, a gases volume is related to its pressure: as volume increases, pressure decreases; as volume decreases, pressure increases.

The effort's goal was to determine the pressure with which gas would fill the lungs, like the bag was filled with gas and fluid in the test firing into the plywood skull boxes. This became a huge theoretical as well as practical problem which soon ballooned well beyond the scope of this inquiry.

I approached this problem with an effort first to determine the pressure generated in the shotgun's barrel when the relevant round was discharged. Unlike rifled weapons with heavy barrels, shotguns are considered to be relatively low pressure guns with smooth steel and relatively thin barrels. Measurement of pressure generated within the barrel is therefore somewhat easier. This can be done with piezoelectric gauge – a method of measuring pressure in a barrel by using a quartz crystal. [This can be done, and will be done if requested in a supplemental report.]

However, once this is done, deciphering this pressure into meaningful gas volumes becomes difficult at best. Variables include temperature, both combustion and ambient, as well as variable features of the vessel containing the pressure. As we know, there are no uniform statistics on the nature of human male torsos – including lungs – as gas containing vessels.

Suffice it to say that sufficient pressure is generated by the Ithaca shotgun blast to aerate fluids including blood in human lung tissues. It is also sufficient to damage such delicate tissues and generate broken blood vessels and hemorrhage. Although regrettably this is somewhat unscientific, 'unscientific' is often the best that we can do for practical purposes. To do more in the name of science imports a false sense of precision unwarranted by the facts at issue and becomes merely unscientific pretension.

Part Three

Issues with other investigations:

- Official Investigations
- Unofficial Investigations
- Questions of Motive

Official Investigations

Original and Only Scene Investigation Errors:

The history of this case is described in Part One. Considering the physical and circumstantial evidence available in this case, it is surprising that Col. Sabow's death has received the careful scrutiny of multiple investigations. However, regardless of the number and care of any official investigations into any death, the ultimate success of a death investigation remains inextricably tied to the care and completeness of the original documentation of the scene, the body, and the forensic autopsy.[8] This case is no exception. Unfortunately, errors of both omission and commission were committed in the original scene investigation of Col. Sabow's death.

Invariably most investigations involve such errors. To err is human; to recover from such error, however, often requires additional testing and experiment that would be unnecessary if the error were avoided in the first place. That underscores the importance of proper and complete scene and body documentation – often in an investigation we do not know what will become significant as our understanding of the case grows through later investigations. With proper documentation, we can revisit items not originally thought to be significant but that may later turn out to bear the weight of the entire case. Questions arising later can be answered only if sufficient data is included in the original documentation of the body, the scene, and the autopsy. It is for that reason that autopsy samples are retained by medical examiners: this allows subsequent investigators access to the original data. It is for that reason that notes are taken, drawings made, and ROI's are written. The data left for analysis, then, is often whatever remains in the various ROI's.

Like most cases, Col. Sabow's death scene investigation involves regrettable errors. The most serious errors involve incomplete documentation – errors of omission. [Errors of commission such as touching the weapon without gloves, etc., are documented in the reinvestigation of the original NIS work. I limit my attention to more significant errors here which bear on my own investigation of Col. Sabow's death.]

Documentation Errors:

The most serious error involves the ***complete failure*** to document the weapon involved in the death. No photographs were provided of the weapon, the shots hells, either the fired shot shell from the left barrel, or the unfired shell from the right barrel. No photos were

[8] See my article, appearing in proof form #0083, to be published in *The International Encyclopedia of Forensic Science & Medicine* by Elsevier Press, 2005, titled "Crime Scene Management in the United States."

taken nor were any notes made about the trace evidence found INSIDE each barrel, or on each shot shell. Additional omissions are listed below:

1. Failure to document the condition/trace materials/locations of the shotgun's stock
2. Failure to distinguish between 'finding no finger prints' and 'finding no identifiable finger prints' on the weapon
3. Failure to measure accurately the length of the weapon from muzzle to butt: the given measurement in the NIS Report is 34 ¾" however, muzzle to butt is much closer to 44 1/8" – the given measurement would place the butt somewhere in the middle of the wooden stock. The problem becomes a type of slippery-slope fallacy: if we know that this measurement is wrong, why should we trust the other measurements? The answer is that we should not: therefore, we must re-measure and check each measurement that is possible to re-measure and check. Unfortunately it is not possible to re-measure the decedent's arm length etc.; however such checking becomes ultimately unnecessary in this case since the distances involved are not critical.

Perhaps the most significant error in ***each*** of the subsequent investigations is the ***complete failure*** to note these errors of omission found in the original NIS scene investigation. Such oversights do not inspire great confidence; however there are reasonable and excusing explanations. While I understand that a reticence to mention errors of omission may come from pure motives, I disagree that this reticence is a benefit to anyone or any agency involved. In forensic science, "critical" means "careful" and ought not to entail a personal attack or the devaluation of a person or an agency doing difficult work under less than desirable circumstances. The best way to learn is to make mistakes and to have them corrected. The chances are good that the mistakes will not be repeated. The best way to improve it to follow the dictates of science: present work openly and invite peers to review the work: the goal must remain truth, however illusive that goal may become. No reason exists to make that goal even more illusive by compounding errors by shoving them out of sight.

The next most serious error involves the ***complete failure*** to document the decedent's right hand. The only photo of the decedent's right hand made available to me is a picture of the left hand which coincidentally includes a shot of the small bloodstains on the right hand. The source of such errors often rests in unwarranted assumptions made by the investigator on scene.[9] Somehow, perhaps the blood and the apparent muzzle effluent appearing on the left hand precluded investigators from raising questions about the role of the right hand.

The next error involves the inadequate documentation of the area surrounding the body in the back yard. The general range of bloodstains and bloodstain patterns around the body

[9] In my 1992 paper "Can We Believe What We See if We See What We Believe? Exper: Disagreement," *Journal of Forensic Sciences*, Vol. 37, No. 4, July 1992 I discuss this problem. One result is that when assumptions change, the data we thought was irrelevant and hence was undocumented now becomes necessary to address the new questions raised by these new assumptions. If it is absent, then the investigation reaches an unnecessary roadblock.

can shed great light on the position of the decedent when the shot was fired. On the video tape, agents can be heard commenting on the bloodstains observed in the grass, but no sketch of the area involved was made, no photos of the stains were taken, and no volume studies were undertaken.

The latter omission is completely understandable, and should not be interpreted as an error. Such studies involve efforts to determine how much blood soaked into the ground as a result of the injuries sustained by the victim. Often this can be done by determining the volume of blood remaining in the body at autopsy, and doing the simple math. However when uninformed offhand observations are made about "minimal blood loss" for example [see below, the EMT who opined 50 ml. of blood loss only] and are somehow mysteriously elevated to the level of 'fact,' often the only scientific refuge becomes appeal to sound documentation and reasoning through applied scientific principles [again, see my scientific/mathematical assessment of this issue below].

Other Documentation & Reporting Errors

I requested and was given all the photographs and documentations associated with the physical evidence in this case. If this is true, then documentation or other issues exist within the agencies producing ROI's. I focus only on the information and documentations associated with the materials relevant for my investigation: the scientific, and medical physical evidence and its scientific processing.

When physical evidence is reviewed, documentation, by notes and photography, becomes an integral and standard part of the analysis. Yet the following difficulties were noted:

On January 25, 1991, (b)(6),(b)(7)(C) requested the following: 017-91 item (A) terry cloth robe; item (B) white undershirt: exam requested: conduct close up photographs of items (A) and (B) concentrating on blood-stained items. [See Appendix III for copy of request]. No such photographs were provided. Either the request went unfulfilled, or the photographic documentation was lost. Either way, an error is involved.

A copy of the scene video was of very poor quality. I requested a cleaner copy – the copy provided was at least a second or third generation copy of another copy. Somewhere the original video exists. I never received a clearer copy of the scene video.

Often, the scene video provides the only way to recover from errors of omission. In fact, this was the best way available to me to determine the type and nature of the Ithaca shotgun involved in the Col's death. The inability to provide that video or the inability to locate it constitutes a lesser but significant administrative error. These types of mistakes can also provide unnecessary road blocks to investigations and are important but not often easy to avoid.

Errors of commission:

In hind sight it is easy to criticize investigators. For safety, it is important to secure loaded and potentially dangerous weapons at any crime scene. However, some balance must be achieved between safety and evidence preservation. The assumption here appears

to have been that Col. Sabow's death was a suicide, and self-inflicted, therefore the same caution involved in an obvious homicide need not apply. That is why it is useful to assume that any death investigation is a homicide investigation: it allows for the most caution, the most completeness, and the greatest care with the potential evidence. It also involves asking and answering the greatest number of questions at the scene.

On the video, the investigator unloads the shotgun, and examines the barrels at the scene. While it may be appropriate to open the breach and effectively disarm the weapon at the scene, the preservation of potential trace evidence calls for further weapon processing at a laboratory facility. Blood and tissue evidence on the shot shells needs to be documented both notes and photographs; this appears never to have happened. Also, multiple investigators wearing gloves handling the weapon can potentially remove or obliterate valuable trace evidence as well as finger prints.

Fingerprint Errors:

To state that no fingerprints were found, as indicated, may be accurate or it may be misleading. Does this mean that NO fingerprints, meaning no partials, no smudges, and no smears appear on the weapon? Or does this mean simply that NO IDENTIFIABLE prints could be lifted from the evidence? The difference can be very significant, especially if the reports making this statement are read by those unfamiliar with the goals of latent print analysis.

It is unclear from the documentation provided just what meaning is intended. If standard usage prevails, however, the statement made does not necessarily mean that no traces of human contact appear on the weapon. Unfortunately no report clarifies this matter.

The photo on the left shows at least three gloved hands touching the weapon at the scene after the agent holding the weapon has opened the breach and removed both shots shells.

With this amount of handling it is not necessarily surprising that identifiable fingerprints were not found. Although the agent appears to be looking into the breach from both directions, it is unclear what he reported seeing.

Unofficial Investigations

Errors in Dr. David Sabow's Continuing Investigation:
After my review and analysis of the official investigations and official reinvestigations of Col. Sabow's death, I must conclude that the one remaining and persisting problem in resolving his manner of the death once and for all arises through the efforts of Dr. David Sabow. Dr. Sabow **disagrees** with the conclusions of each of these investigative efforts – he disagrees that his brother died a suicide and insists that his brother was murdered. Despite the fact that his efforts alone resulted in my investigation of this case, Dr. Sabow has been singularly uncooperative in providing any evidence in his possession for my review and analysis. I find this utterly mystifying.

Here it is useful to distinguish **the rational resolution of any scientific or factual issue** from **the universal acceptance of that resolution or fact**. Such a distinction is well known among historians of science and scientists, and remains common in law enforcement, judicial and forensic contexts. For example, the issue of our solar system's organization, in so far as the sun remains at center and the spherically shaped planets orbit the sun, has observational, computational, and practical evidence virtually closing the books on the "issue." Given this evidence, no scientists seriously maintain that the earth is the center of our solar system, is non-spherical, and that the sun orbits this flat earth. In other words, given the evidence, the issue has been **rationally resolved**.

However, this rational resolution does not entail its **universal acceptance as fact**: there remain individuals who hold, contrary to the evidence, that the sun orbits the earth and is flat. Some have elaborate arguments to support their contrary positions [see "The Flat Earth," in Martin Gardner *Fads and Fallacies in the Name of Science*]. In fact, we know that individuals can believe almost anything despite contrary or even contradictory evidence. So some sort of universal agreement has never been held in high regard as a **criterion for the truth of any scientific proposal.** Instead, the emphasis in science remains upon sound method, sound logic, and a scrupulous fixation on relevant data. The fact that Dr. Sabow disagrees with offered proofs **remains significant only if the proofs fail to be based upon sound method, sound logic, and scrupulous fixation on relevant data**. Further, his conclusions remain flawed if they themselves demonstrably fail to meet these criteria.

Dr. Sabow presents his reasoning in support of his conclusion that Col. Sabow died as the result of a homicide in several documents included among the data provided to me by Mr. Awtrey. [I have officially requested any additional data that Dr. Sabow may have as evidence in support of his view via a letter, including my request for the weapon and samples of the 12 gauge Dove & Quail ammunition, but I have received no reply to date]. In fact, Dr. Sabow's investigative efforts appear singularly focused upon proving that his

brother's death was not a suicide but a homicide, often at the expense of scientific accuracy and sound scientific method.

The obvious motive for an investigation into any equivocal death is to arrive at a true understanding of the death's nature, or at least to arrive at an understanding sufficient to determine the death's manner. Of course then the hope remains to obtain justice in the event that the death proves to be a homicide. Determining a motive behind Dr. Sabow's persistence in insisting that his brother's death was a homicide, despite the rational resolution of the issue well established by the above described investigations, remains well outside the scope of my own particular scientific work. I therefore choose to ascribe the above sound motive to his considerable efforts and to assume that they are offered in good faith – namely, that he is attempting to reach a true, scientifically supportable explanation of the death and that he is attempting **rationally** to resolve the issue, an issue which, of course, just happens to have great personal importance both to him and to his family. The relevance or irrelevance of this latter fact again remains outside the scope of my scientific work.

However it appears that the scientific **work he presents as evidence** to prove that Col. Sabow died of homicidal violence remains seriously flawed – it represents a failure of method, logic and data selection. Therefore, if Dr. Sabow persists in holding that his brother died a homicide rather than a suicide based solely upon this work, one is forced to conclude that he is simply failing to agree with the **scientifically established rational resolution of the issue**, and that such disagreement [as documented to date] lacks any rational foundation.

I discuss these issues briefly, including his use of data, with errant inferences from that data, his interpretation of the medical evidence, his use of experts, and his attributions of motive for the death in order to clarify the rational basis of his position to date. Of course if additional data become available, some reassessment may become necessary. However it is difficult to foresee what such data could possibly be in light of the existing medical and scientific evidence available in this case.

Use of Data:
The major issues with respect to the medical and scientific evidence cited and used by Dr. Sabow in his attempts to persuade officials that his brother was murdered include simple *factual errors*, *irrelevant citations with erroneous comparisons*, and *the omission of contrary or contradictory data*. It appears to me that Dr. Sabow may not have reviewed all the relevant data from the scene and the autopsy. He may not have access to all 78 death scene photos and all 39 autopsy photos and all the x-rays. On that assumption, his errors of omission become understandable, as does his conveyance of incomplete and thereby potentially misleading data to his scientific experts. Reviews based upon incomplete data remain virtually without merit.

Factual Errors & Issues -- a list of Claims and brief replies in *italics*:
"Inconsistencies" – gag reflex against 'soft pallet' – "autonomic gag-reflex" would prevent shotgun being shoved so far into victim's throat [STS, Affidavit, p. 21] *This is*

explained by falling into the weapon – the weapon kicks [moves up] after the shot

"no exit wound is consistent with Jimmy having been hit on the back of the head by some taller, strong right handed person prior to being shot" [STS, Affidavit, p. 21]
Erroneous comparisons – there is no reason for this to follow or be true

Blood from blow in a narrow space between the skull and dura forms a casing around the skull preventing an exit wound [STS, Affidavit, p. 21] *this is false – all bleeding is from multiple fractures via shotgun injury.*

No blood or "blow back" on victim's clothing [STS, Affidavit, p. 22] *This is not true:*

There is in fact some blood, as seen above on the robe by the left arm as one would expect: but our testing shows that none or little is to be expected in the scenario modeled. This confirms as the best explanation of the death that the decedent took his own life.

Lack of blood on grass near victim's body is inconsistent with leaning forward and shooting himself [STS, Affidavit, p. 22] *No evidence shows that there is no blood on the grass or near his body – this is factually false given scene video/audio – blood is present on the grass in front of the body.*

Victim would have been driven backward out of his chair by any self-inflicted blast [STS, Affidavit, p. 22] *this opinion is contrary to the laws of physics – and is perhaps based upon viewing inaccurate TV and movies – when someone is shot, they follow their center of mass and fall in the direction they lean – unless they are hit by a mass larger than their own such as a car or a truck. Then they follow that mass.*

Suicide does not fit with victim's character, state of resolve, or facts [STS, Affidavit, p. 25] *IT does fit with the physical evidence, the scene, the autopsy, and all the testing.*

Huge swelling on the right rear of victim's head is a sign of external trauma [STS, Affidavit, p. 39] *Not true: trauma from discharge of weapon into mouth accounts for all of these observations.*

Failure to take fingernail scrapings at autopsy = evidence of cover up and supports that the victim engaged in a struggle before victim's death [STS, Affidavit, p. 40] – *not true,*

and this does not follow: if such evidence was not collected, then nothing follows about it other than this represents another investigative omission and failure – no other signs support a struggle: no injuries.

"World renowned experts actually examined the evidence and not merely read reports" [Dr. Sabow letter to Senator Leahy, 8/5/02, page 1] *this not true: one x-ray and a couple of autopsy photos screened by Dr. Sabow's wife does not entail "the evidence."*

Special Homicide investigator Bob Romaine has determined victim's death to be a murder [Dr. Sabow letter to Senator Leahy, 8/5/02, page 1] *if true, the question is 'based upon what evidence?' It is important to remember that homicide investigators do not have expertise in forensic science and medicine – falling off a log does not necessarily make a person expert in physics.*

Discharge of the gun would result in to destruction of the brain stem and would result in the blow back of vast quantities of blood and gases [Dr. Sabow letter to Senator Leahy, 8/5/02, page 4] *Blow-back is much less than the blow forward: into the tissues such as the lungs which can absorb the gases and energy generated by the weapon's discharge: tissues such as lungs are more elastic and can absorb more energy without laceration: compared with skull bone, etc.*

If sitting in the chair when shot, then victim's clothing would have been covered with blood [Dr. Sabow letter to Senator Leahy, 8/5/02, page 4] *This is proven to be false by each of our tests and experiments.*

The back of his left hand would have been drenched with blood – the hand which allegedly held the barrel – virtually no blood on the front of his entire body [Dr. Sabow letter to Senator Leahy, 8/5/02, page 4] – *not so, our tests show that the hand would have had blood associated with it just as in the photographs of the decedent's left hand.*

Blood [aspirated blood] cannot be in the lungs without breathing; can't aspirate blood without a brain stem [Dr. Sabow letter to Senator Leahy, 8/5/02, page 5] *this claim is demonstrably false on two fronts: first, tissues exist such that breathing for one or two breaths was possible, and second, the infusion of gas from the discharge of the weapon would have sufficiently aerated the liquid blood as well as provided more blood.*

Massive swelling behind the right ear is result of a depressed skull fracture [Dr. Sabow letter to Senator Leahy, 8/5/02, page 5] *no, it is the result of displaced skull fracture, the many bones broken from the base of the skull as described at autopsy, and the bleeding and swelling from the shotgun injury.*

A hematoma between the scalp and skull means that the victim received blunt force trauma prior to being shot [Dr. Sabow letter to Senator Leahy, 8/5/02, page 5-6] *No, not in ALL cases: when a shotgun destroys the skull and brain, it too produces bleeding in all the membranes!*

A straight line or margin of blood on the ulnar side of the left forearm with streaking blood on the radial side proves that when the victim was shot in the mouth, his arm was lying on a flat surface and positioned in front of the mouth which was the only possible way to get that blood stain pattern [Dr. Sabow letter to Senator Leahy, 8/5/02, page 6] *This is false: as indicated in my analysis of the photograph, gravity accounts for the staining as observed – in fact, if the decedent were prone when the shot was fired, the stains would look much different, and the inside of the arm would have the gravitational stains noted on the upper/outer aspect of the arm.*

Not one drop of blood on the gun – yet the bloodiest of all shotgun wounds – not possible he says [Dr. Sabow letter to Senator Leahy, 8/5/02, page 6] *this is simply factually false: there was report that some blood appeared inside the barrel: unfortunately, a more profound description with accompanying photos was not provided.*

Right profile photo of skull with scalp reflected back to front – shows multiple skull-fractures/associated scalp hemorrhaging/extruded brain matter/blackish red clotted blood [Dr. Sabow letter to Senator Leahy, 8/5/02, page 6] makes two points:

1. x-ray shows no boney fragments or shotgun pellets in this clot
2. (b)(6),(b)(7)(C) stated that at autopsy, that there was "no blood between the scalp and the skull (bolded by Dr. Sabow)" - & - "because of the swelling in the back of the head, it would appear as if Colonel Sabow had been struck on the head but that the lack of any blood proved that he hadn't(bolded by Dr. Sabow)."
3. Dr. Sabow argues that when (b)(6),(b)(7)(C) was asked "Was there any of that bleeding to indicate a blow had come from the outside?" she answered "There was none."
4. Dr. Sabow concludes that 3 is a blatant lie proved so by the photo and x-ray [Dr. Sabow letter to Senator Leahy, 8/5/02, page 6-7].

It is very difficult to understand what sense this makes – there is no way to tell from the photo if there is or is not a pellet or pellets present in the clot: recall that there are over 300 small birdshot pellets in the relevant round. This comment makes no sense whatever as many such clots will be present most without pellets as a result of multiple fractures due to gunshot would trauma from the discharge of a shotgun into the mouth.

He states that the OIG, DOD Oversight Review was "nothing but a restatement of the NIS (report) and **does not address any issue of evidence that has ever been raised." He further adds that Dr. Jack Feldman, Chairman of the Department of Neurobiology and Physiologic Sciences, UCLA, after reading the DOD report stated that it "defies any scientific scrutiny."** [Dr. Sabow letter to Senator Leahy, 8/5/02, page 7]

Note: this report and this independent investigation represents a sincere effort to "address issues of evidence" that have been raised by Dr. Sabow, and to provide the required scientific scrutiny which Dr. Feldman believes to be lacking in the prior reports. Also note that to my knowledge, Dr. Feldman has not seen ALL the relevant ROI's and that therefore he has limited data upon which to base this opinion.

Dr Sabow states that for the first JAGMAN Report, Col. Verducci was ordered not to consider either the autopsy or the NIS reports but to rely simply on the Death Certificate for his conclusion. He further states that when Verducci subsequently reviewed the evidence, "he concluded that Colonel Sabow had been murdered, stating "His death could NOT HAVE BEEN SELF-INFLICTED." [Dr. Sabow letter to Senator Leahy, 8/5/02, page 7] *Of course, a JAGMAN report has nothing to do with scientific material, so it is difficult for me to understand this comment. [Mr. Verducci's eloquent letter speaks for itself: see correspondence section, Appendix III].*

Verducci was given a list of findings prepared by Col. George Lange III, Deputy JAG of the USMC before his 'investigation' began [Dr. Sabow letter to Senator Leahy, 8/5/02, page 7] *Nothing sinister follows from this claim. Information provided, information reported.*

NIS is a fact finding body not authorized to reach any conclusions – it must turn over the results of their investigation to those responsible for determining manner of death [Dr. Sabow letter to Senator Leahy, 8/5/02, page 7] *It does reach investigative conclusions.*

Department of the Navy and the DOD are responsible for determining the manner of death – except under mitigating circumstances "such as clearly exist in this case" then the FBI under US TITLE 18 section 1111 is responsible [Dr. Sabow letter to Senator Leahy, 8/5/02, page 7] *It is unclear that they exist, but that is irrelevant to this work.*

[Evidence provided to FBI included nothing not already in the file – where does the suspicious nature of the death originate?]

Dr. Vincent DiMaio answered Dr. Sabow's rather elementary and misleading & misdirected questions with the evident frustration of a knowledgeable professional too busy to baby-sit fanatics – hoof beats, think horses, not zebras [Dr. Sabow letter to Senator Leahy, 8/5/02, page 8]

Dr. Brian Blackbourne spoke with Gene Wheaton – he stated to Wheaton "I don't understand how Colonel Sabow could have inhaled blood when he had no brain stem." [Dr. Sabow letter to Senator Leahy, 8/5/02, page 8] *He may not have said this according to the IG Report – besides he knows well that there are other mechanisms such as aeration via gas discharge available as well to explain the bubbles in the blood.*

Only Dr. Kent Remly has been contacted by a government investigator – he wrote the unanimous opinion of the six 6 neuroscience professors at the University of Minnesota – Dr. Sabow stated that "he never changed his opinion, nor did any of the other professors -- Remly states that Nancy Sundervan tried to get him to change his opinion after he reiterated his view that Col. Sabow had been struck on the back of his head before he was shot" [Dr. Sabow letter to Senator Leahy, 8/5/02, page 8] *I know of no evidence to support such a contention: none has been provided and none is forthcoming.*

Dr. Sabow states that the FBI position on staged crime scenes is "utter nonsense" – Dr.

Sabow believes that the scene was staged to present a suicide rather than a homicide – [references to sexual homicide or robbery elude him in FBI's ROI with respect to behavioral sciences] [Dr. Sabow letter to Senator Leahy, 8/5/02, page 9] *To dismiss a careful analysis with such hand waving does little credit to a rational attempt to seek the truth.*

Bill Grode, Larry Collins, Orange County Asst. DA Mike Jacobs, Rapid City SD detective Bob Romaine and Rapid City SD Chief of Detectives Chris Grant "all have evaluated the evidence and all state categorically that his was an obvious homicide" Judge Marshall Young stated that in his 30 years as a judge he had never seen a murder proved so conclusively [Dr. Sabow letter to Senator Leahy, 8/5/02, page 9] Dr. Sabow opines that "What else does the FBI want? Aren't these expert (sic.) [experts] enough for them?"

It is wise to remember that not all experts are equally expert on the same things. No one with forensic training who has examined the 'real evidence' in this case has concluded that Col. Sabow was murdered. The physical and medical evidence points unequivocally toward suicide.

"The evidence proves that he was incapacitated" [Dr. Sabow letter to Senator Leahy, 8/5/02, page 9] *This is true: but only after he was shot by the shotgun.*

Skull was depressed by a full inch [a depressed skull fracture] [Dr. Sabow letter to Senator Leahy, 8/5/02, page 9] *This is Dr. Sabow's misuse of the term "depressed skull fracture" as noted above.*

"The autopsy x-ray clearly depicts the massively depressed skull fracture and the autopsy describes the inhaled blood that could not have been inhaled after the gunshot to the brain and brain stem" [Dr. Sabow letter to Senator Leahy, 8/5/02, page 9] *This is factually false.*

The FBI refused to interview the experts [Dr. Sabow letter to Senator Leahy, 8/5/02, page 9-10] *They may not have refused: perhaps like me, they were simply unable to locate them in time to complete the work? Or perhaps they realized that they had nothing positive to offer the investigation and contact would be worthless for the overall project..*

John Collingwood quote of ATF study – few prints found on weapons -- Fingerprint issues on the weapon – says it refers to handguns not shot guns or rifles -- [Dr. Sabow letter to Senator Leahy, 8/5/02, page 10] *In fact shotguns are often less greasy than handguns; the barrels are much lighter and made from mere tube steel, unlike rifled gun barrels – it is true that few IDENTIFIABLE prints are found on weapons of all sorts used in violent crimes.*

[End of factual claims listed with comments]

Omissions of contrary or contradictory evidence: Autopsy Interpretations:
My only comment on the autopsy of Col. Sabow involves potentially incautious use of language. It must be remembered that autopsy reports are often read and studied by non-forensically trained individuals such as clinical physicians, lawyers, judges, and concerned family members. As such, forensic pathologists must include a built-in concern for the cautious use of language and avoid temptations for overstatement. The description of the decedent's central nervous system comes to mind.

Dr. Singhania states that "no intact brain stem can be identified because of massive laceration, due to gunshot wound." And later, Dr. Singhania states that "Again, pieces of cerebellum could be identified. No intact cerebellar cortical tissue is noted. No intact brainstem, including midbrain, pons, or cerebral peduncle is identified. Only a small portion of the medulla and spinal cord is noted in the foramen magnum which **is removed and saved**.(my emphasis)." The issue arises only for those not reading Dr. Singhania's report carefully.

The report states that "no intact brain stem can be identified." From this Dr. David Sabow concludes that the medulla was ***pulpafied*** and that after its destruction, respiration remained impossible. While 'pulpafied' may be a perfectly good description of certain organs damaged by the energy wave from a shot gun round, when the word is pushed hard by anyone attempting to draw certain conclusions from the word alone without regard for an organs actual description, errors may result. Specifically, the decedent's brain stem is not *pulpafied* if we mean by that word "turned to mush without any remaining structural integrity." Indeed, contrary to claims made by Dr. Sabow, the brain stem did retain neural structural integrity. Dr. Singhania's report continues, stating that "only a small portion of the medulla and spinal cord is noted in the foramen magnum which is removed and saved." This statement receives not attention from Dr. Sabow.

Yet according to Dr. Zaias, board certified in neurology, anatomic pathology, neuropathology, and forensic pathology, she sees "segments of cervical cord from the first cervical vertebrae, C-1 through C-4 . . . reparatory function is modified and participated in by fibers that go down the spinal cord above C-4, higher than that, you will have respiratory failure and very rapid death. But if that is intact, as it was in this case, as I could show you in the bottle, it is possible anatomically . . . and it was still connected to lower medulla where there are even higher concentrations of fibers involved in respiration – that breathing was still possible."[10] This feature of the physical evidence provides yet another possible explanation for the observation of "aspirated blood" in the decedent's right lung at autopsy. [The other explanation involves the massive infusion of gases at pressure introduced into the decedent's oral cavity by the discharge of the shot gun.]

Therefore, Dr. Sabow's claim that respiration was impossible remains unsupported, as well as unnecessary to explain the observation of "aspirated blood" in the right lung.

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[10] Office of the Inspector General, item 67C; "Review of the Naval Criminal Investigative Service Investigation into the Death of Colonel James Emery Sabow, United States Marine Corps, page 10.

Errors based upon anecdotal statements and EMS Report:
Dr. Sabow raises issues concerning the decedent's blood loss at the scene which he believes is 'minimal' when considering the nature of a 12 gauge shotgun wound to the head. The problems with this avenue of inquire described by Dr. Sabow is detailed below:

Source: El Toro EMS Report
Observations: blood notes on left ear with blood draining from the right side of his head
Interpretation by EMT: estimated blood loss [based upon these observations] = 50 cc [Dr. Sabow says this is equivalent to approximately 1 2/3 ounces] – note that cc and fluid ounces are units of volume.

Dr. Sabow's apparent inferences from this EMS report:
From this 'datum' he states that ***"since an intra-oral shotgun wound is the bloodiest wound that the human body can sustain, it follows conclusively that Colonel Sabow was either dead or very near death, when he was shot in his mouth."***

[Note that this inference does not follow from the above datum, even if the datum were accurate.]

Factual & Scientific Errors at Issue: the estimated blood loss ***volume*** of 50 ccs or 1 2/3 fluid ounces is based only on the ***area*** of blood visible to the EMT both on the ground and on bloodstained ***areas*** on the decedent and his clothing [left ear, robe, t-shirt, etc.]

To help more accurately ***estimate external blood loss volumes***, forensic investigators, [not EMT's] should measure any blood which may have soaked into the ground. On a grass lawn, for example, blood does not simply pool like blood pools on a tile floor. The scientific error here involves mistaking ***areas*** for ***volumes***. The area of a rectangle, for example, is determined by multiplying the length times the width:

$$\mathbf{A = L \times W}$$

The ***area*** [of a circle, for example] is given by the following formula:

$$\mathbf{A = \pi \times R^2}$$

[Area = pi which is about 3.1416 times the radius squared which is the radius times itself]

The ***volume*** of three dimensional areas such as captured by *fluid ounces* or *cubic centimeters* is given by entirely different mathematical formulae:

The volume of a rectangular box, for example, is determined by multiplying the length times the width times the height:

$$\mathbf{V = L \times W \times H}$$

The volume of a cylinder, for example, is determined by multiplying the circumference times the height times the area of the base:

where **C = D x π** and **A = C x ¼ D**, then

V = C x H x A

In fact, determining the ***approximate volume of blood*** soaked into sand or soil is a much more complex process. It involve first, separating [or extracting] the blood from the sand or soil, then second, measuring the resulting volume by measuring the blood contained in a cylinder or in a rectangle, and applying the relevant equations given above.

In this case given the nature of the decedent's devastating intra-oral shot-gun injury with 12 gauge Dove & Quail birdshot, most of the massive bleeding remained contained within the decedent's thoracic cavity and also within the organs contained therein, including the lungs.

Therefore, the estimated blood loss of 50 ccs is scientifically meaningless – it ignores both the ***volume*** of the blood shed outside the body, and it ignores the ***volume*** of the blood shed inside the body [see autopsy report].

Therefore, any inferences drawn from this 50 cc blood loss estimation are also without any scientific significance.

Dr. Sabow's Use of Experts: My Letters of Inquiry:

I attempted to contact, in writing, the scientific experts listed by Dr. Sabow as providing definitive evidence that Col. Sabow died as a result of homicide. In addition, I was asked by Secretary Abell to contact Attorney Mr. Antonio Verducci regarding his insights into the death. Without benefit of Dr. Sabow's assistance, I had to track down some of these individuals and locate their new addresses. I was unsuccessful in several instances. However, I believe that any information these experts may have is based upon incomplete and partial data provided to them. The information appears to be only a part of the information made available to me in my own work – either limited to a single x-ray, to a few photographs, or to the interpretations of Dr. Sabow, a clinician rather than a forensic expert. Therefore the inability to contact each expert has no significant bearing on the conclusions reached in this investigation.

The letters to these clinical and research experts and their replies are available in Appendix III, Correspondence section. Dr. Sabow denies that his experts have been contacted by official government investigators although some are quoted as having been interviewed in the Inspector General's investigation and documented in that report. I believe that not all his experts were contacted – indeed, I had great difficulty contacting several formerly with the University of Minnesota as I did not even know their names.

However, as stated, I do not conclude that their information has great merit based upon the non-forensic background of these clinicians and researchers. The distinction between

opinions on forensic issues from forensically trained medical professionals and opinions on forensic issues from a clinically trained or a research practitioner is significant. Clinicians apparently fail to understand the nature of forensic applications of science and medicine: for example, that "aspirated blood" may be produced by mechanisms other than those involved in normal autonomic nervous system brain responses.

The possible exception is Dr. Fackler; however his work in wound ballistics focuses on clinical treatments and not just forensic analyses. According to his letter, he did not have much information about Col. Sabow's death.

Motive in Col. Sabow's Death

Voluminous data has been provided in various reports concerning charges pending against Col. Sabow, potentially resulting in his eventual demand for a court-martial hearing. Charges advanced included the misuse of military aircraft for personal purposes. Dr. Sabow has alleged far more to be involved in the realm of what his brother knew, and how this knowledge may have contributed to his death. Issues of motive are beyond the scope of this scientific and medical investigation.

This inquiry is limited to the available physical evidence and does not include areas beyond the scope of forensic science and forensic medicine. It is sufficient here to state that after studying the available information provided in the reports, including materials provided to the DOD by Dr. Sabow, any data providing a motive for homicide equally appears to provide a similar motive for suicide. As such, the issue of motive seems both irrelevant to, and beyond the scope of this inquiry. Therefore nothing can be stated about motive from a scientific or medical point of view other than it appears to this investigator as a neutral element working equally, *certus parabus*, for homicide and for suicide.

Part Four

Pressures on this investigation:

- Summary of Investigation: external pressures
- Conclusions

External Pressures Recounted:

Dr. Sabow's investigative pressure:

I received absolutely no pressure to reach any particular conclusion in this work from my employers in the DOD, from the House Armed Services Committee members, or from any member or official from any branch of the U.S. armed services. Nor was any local government agency any less than fully cooperative in my efforts. In fact I was both encouraged and supported by Mr. Awtrey and Secretary Abell in my customary effort independently to apply sound methods of scientific and medical analysis, and to follow the evidence wherever it leads.

As soon as I received the Federal contract to work this case, I was immediately contacted by Dr. David Sabow, who informed me that he had spent the past thirteen [13] years and

a considerable amount of his own funds *trying to prove* that his brother, Col. James E. Sabow, was murdered.

He first introduced himself to me as my "co-investigator" which prompted me to review the language of this contract and to contact both Mr. Awtrey and Secretary Abell for clarification. I was assured that I was not working with Dr. Sabow, nor was Dr. Sabow working with me. I was also not working "for him" in any capacity. I accepted my task as an independent forensic scientist seeking the truth best revealed through the scientific, medical, and other relevant facts.

I greatly admire Dr. Sabow's passion and dedication, and I assured him that I too share a passion and dedication for uncovering the truth through applying my knowledge, training, and experience through applications of the natural sciences and forensic medicine. However, his project remains scientifically suspect from the outset – his stated objective is "to prove that his brother was murdered" rather than "to investigate the status of his brother's death." It appeared to me that his project could be tainted with pre-analytical beliefs which might prejudice any outcome (for reference regarding my analyses of these issues in the context of forensic science and death investigations, please see my article "Can We Believe What We See If We See What We Believe? Expert Disagreement" *Journal of Forensic Sciences*, Vol. 37, No. 4, July 1992).

As an ordinary observer and participant in daily life, I have found anecdotally that most people's personal strengths also double as their personal weaknesses. I learned this to be true of the good Dr. Sabow. Passion and dedication can also present, at times, as fanatic prejudice and a focused closed mindedness. I fear that these characteristics have supplied and generated the major obstacles to closing this investigation and to explaining Col. Sabow's death in clear scientific terms by following the physical evidence [see the section on *Motive in Col. Sabow's Death*, below].

Dr. Sabow also remains extremely persistent. For example, on July 21, 2004 he contacted me once again by telephone demanding that I call him immediately with my results after only 10 full days work. In an effort to remain cordial, I returned his call. I said that I had not yet completed studying the well over 2000 pages of documents, photographs, and x-rays, but that I would be glad to speak with him – I had at that time completed my study and analysis of the available post-mortem x-rays.

I explained my plans for testing the Ithaca double barrel, side-by-side shotgun, and the Winchester 12 gauge Dove & Quail bird shot ammunition believed to be instrumental in his brother's death. I said that I needed to investigate the various mechanisms which result in frothy blood in the lungs – this so-called 'aspirated blood' in the lungs is usually characterized at autopsy by a bubbly or frothy appearance.

All Dr. Sabow's claims, and the supporting claims of many of his 'experts,' depend upon assuming that the *only mechanism* to produce such blood in the lungs is the victim's breathing, preceded by a non-fatal injury, which in turn somehow produces blood in the victim's airway, and that when the medulla is destroyed, such breathing is impossible. I

tried to point out that identical observations of "aspirated blood" are commonplace in cases involving gas discharged from a firearm which has been fired in a closed airway, and that in humans, mechanical muscular movements often occur without "normal" muscle-brain interactions.

For example, this muzzle blast gas, together with muzzle effluent, forces mixed blood and gas into previously healthy, crepitant lung tissues. It can also rupture capillaries within these lung tissues, thereby developing increased bleeding in the lungs together with the appearance of frothy bubbly blood found at autopsy. In addition, hearts can continue to beat and breaths can continue to be taken due to involuntary post or peri-mortem muscular contractions or even due to external impacts on the trunk. Such possibilities bear investigation.

He sternly informed me that he was an "expert" in bloodstain pattern analysis and that *he was the MD here,* thereby knowing everything about the human body including everything about finding "aspirated" blood in the lungs – which he said *must be only* from his brother's breathing after some non-fatal blow to the head before the medulla was destroyed (see his given assumptions above). He suggested that what I had to offer by pursuing this research regarding blood in the lungs by testing the weapon was both medical nonsense, and a waste of time *for his efforts to prove that his brother was murdered.*

I attempted to explain that my contract did not call for "proving that his brother was murdered," but called for an independent investigation using my knowledge, experience and training in hundreds of gunshot deaths to help determine what, if anything, the evidence shows about the manner of his brother's death.

Of course I felt insulted, manipulated and consequently very angry at this unjustifiably arrogant, unbecoming, unprofessional, single-minded, and methodologically abhorrent fanaticism. I told him that he alone provided pressure on my investigation to reach his specific conclusion, and I told him both what I thought and what I felt about this ignorant and biased unscientific attitude. Then, in a raised voice and with vigor quite foreign to my professional nature, I hung up the phone. I was neither asked to baby sit family members in this case, nor to provide psychological therapy, no matter how desperately both interventions may be needed. These activities simply do not appear in the language of my contract.

For the record, I do not believe that Dr. David Sabow is capable of the independent rational detachment necessary to appreciate medical and scientific facts concerning his brother's death – especially if those medical and scientific facts point toward a conclusion differing in any way from his own preordained, received, and revered position that his brother was murdered. I do not think that rational proofs of any scientific, medical, or factual sorts will help such a "true believer" to better understand events. Perhaps it will take professional help from others in areas lying well outside my own limited areas of forensic science & forensic medicine and death investigation to help him

understand why he maintains this position so intractably. I can only recall and restate the words of Voltaire who said that ***"Prejudice is the reason of fools."***

I certainly regret any ill will that my vigorous actions taken to preserve my independence may have generated, but I believe that they were necessary to preserve the integrity of my investigation. I would do the same regardless of the specific conclusion(s) advanced, and regardless of the source(s) of the pressure. Reaching even true conclusions, but for the wrong reasons, remains unacceptable scientific methodology – and thus remains foreign to my scientific practice.

These incidents in no way influenced me to reach any conclusion one way or another concerning the status of Col. Sabow's death. My substantive objections and emotional outburst relate only to my passion for independence, and for sound, and careful scientific methodology. In this work, as always, I simply followed the evidence and presented the results of that work in this report. I remain open to any scientific peer review of my work, and as always, never view my conclusions as infallible truths, or as beyond reasonable scientific challenge, provided that such challenges are based upon well-established facts developed through the application of sound scientific methods.

Conclusions

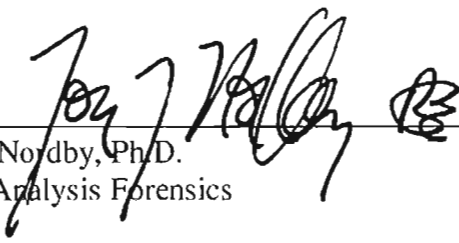
Relevant Data as Evidence & Supported Scientific Analyses in this Case:
The review and study of the voluminous data presented to me in this case, as developed and analyzed above, and as developed through testing and experiment, allowed me to sort the evidence from the coincidental elements and obvious errors in this case. The best explanation of Col. Sabow's death emerges, and is supported by this evidence. The thesis that Col. Sabow was murdered in a conspiracy can not be supported by this evidence. All the scientific and medical evidence unequivocally proves in this case that Col. Sabow died at his own hand and that his death is appropriately ruled a suicide.

If true, Dr. Sabow's charge that the official reinvestigations of his brother's death ignore or omit the real evidence, presents a very serious allegation with sweeping consequences. Most such charges made by civilians against official investigative efforts are based on a view that "government" somehow has a great deal to hide and that much of our government's activities are directed toward concealing malfeasance from the citizenry. The merit or naivety of this claim remains irrelevant to the available scientific and medical evidence in this case.

Despite any claims that evidence has been ignored, missed, or misinterpreted, Dr. David Sabow offers nothing in the way of *new evidence* and no plausible interpretations of the existing evidence to support his unfounded conclusions. All the medical and scientific evidence, including the tests and experiments as part of this independent effort, point clearly and unambiguously toward a self-inflicted shotgun wound as cause of the entire trauma suffered by Col. Sabow. All the evidence visible at autopsy, including all fractures, all internal bleeding, and all blood shedding events, all the trace evidence

visible at the scene, including all the visible bloodstains, finger prints, GSR, and therefore, his death, are explained by a self-inflicted shotgun injury to the head.

Indeed other forensic science and forensic medical professionals have examined this evidence and independently reached the same conclusion.[11] I deeply appreciate the opportunity to provide this independent scientific and medical analysis and investigation and to submit this report. I will gladly supply supplemental reports on both GSR and gas volume studies if such supplemental reports are requested in the future.
QED



11-08-04

Jon J. Nordby, Ph.D. Date
Final Analysis Forensics

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[11] They are named in the IGO report. I also know of several others who have stated to me that they have examined this evidence independently and reached the conclusion that Col. Sabow committed suicide. Their work is unknown to me, and of course I relied on no work but my own to reach these conclusions. I have shared my work and my results with no one at this time other than through issuing this report to my immediate project supervisor, Mr. John Awtrey.

Appendix I

Brief Glossary of Terms in Forensic Science & Forensic Medicine

Note on bloodstain pattern terminology: Many of the various definitions in this field suffer from ambiguity, vagueness, and scientifically unjustified assumptions. To address these issues, the FBI formed a group of 29 independently recognized experts in the field to provide clear, scientifically robust terms as well as to provide scientifically justified protocols for the examination, testing, and interpretation of bloodstain patterns. I am honored to be one of the 29 chosen for this arduous task. Our work, over the past 2 1/2 now 3 years, is designed to improve both the precision of descriptions and the accuracy of interpretation in this important area of forensic science.

Brief Bloodstain Pattern Analysis Glossary – Historical and Contemporary Mixed

Arterial Spurt or **gushing** – pattern explained by pressurized blood pumped through a breached artery

Back spatter – blood flying back toward the source of the force producing the spatter

Cast-off Stain – pattern explained by blood released from a blood bearing object in motion

Clot – the agglutination of blood producing a gelatinous mass through natural properties called 'clotting factors' in red cells, fibrinogen, and platelets causing blood cells to clump together

Convergence point – The point representing the source of a bloodstain in two dimensions

Directionality – features of a bloodstain's shape indicating its direction of flight

Drip pattern – stains resulting from blood dripping into pooled blood, or dripped from a blood source onto a target surface

Drip stain – pattern explained by blood dripped into blood

Expirated or **exhaled blood** – a pattern of small stains resulting from forceful exhalations through the nose or mouth [coughs or sneezes] which project blood from the airway to a target

Glancing angle – The angle between the line of bloodstain travel and a reference direction such as 90 degrees vertical; also called 'directionality'

High velocity impact spatter – historically interesting but outmoded term meaning bloodstains produced by a large magnitude impact force, some say of at least 100 feet per second or greater. Blood does not, however, spatter at this velocity – a confusion relegating all 'velocity terminology' to the circular file – most of the individual spots in this type of stain are 0.1mm or smaller in size – note that this is not 1 mm, but $1/10^{th}$ of a mm. or 100 micrometers – very small indeed, however larger stains are also produced. The term is discarded in contemporary use because it confuses velocity with force – such stains can be produced by indefinitely many mechanisms, not just gunshots. [See SWGSTAIN work product]

Low velocity impact spatter - historically interesting but outmoded term meaning bloodstains produced by a small magnitude impact force, some say of no more that 5 feet per second or less. This term is subject to the same problems and confusions as 'High velocity impact spatter.'

Medium velocity impact spatter - historically interesting but outmoded term meaning bloodstains produced by a magnitude impact force, some say of at 25 per second – spots said to be 1 to 3 mm in

diameter, but problematically, the definition also adds that some are smaller, and some are greater. This term is also subject to the same problems and confusions as 'High and Low velocity impact spatter.'

Impact angle – The angle between the direction of travel and the target surface defined, using trigonometry, as the arcsine of the stain's width divided by the stain's length

Impact site – sometimes used to mean 'point of origin' – the location where some force met a blood source to produce bloodstains

Impact stains or impact spatter – patterns explained by blood dispersed from some force applied to a blood-source, sometimes showing characteristics of the force that produced them

Misting or rouging – blood reduced to a fine spray by applied force of a high magnitude

Saturation stain – pattern on an absorbent surface/area explained by a large quantity of blood soaking through the surface

Spatter – small blood droplets resulting from the forceful projection of blood

Swipe – stain created by a moving blood source contacting an unstained surface

Swipe stain – blood transferred from a moving blood source onto an unstained surface

Target – any surface which exhibits bloodstains

Transfer stains – pattern explained by contact between a bloody surface and a second surface, producing an image of the first surface in the resulting pattern

Void - the absence of bloodstains in an otherwise continuous blood-stain pattern

Wipe stain – blood pattern produced by an object moving through an existing stain altering its appearance

Appendix II

Materials Reviewed

Prior investigations into the death of Col. James Sabow providing reports of [their] investigations (ROI's) were reviewed for my own investigation and are listed as follows:

1. Investigation of scene & autopsy done by Orange County Sheriff-Coroner's Office Santa Ana California [with scene and autopsy assistance/participation/attendance requested from the NIS] Tuesday, January 22, 1991 – ROI dated

2. NIS Investigation [Naval Investigative Service – now the NCIS (Naval Criminal Investigative Service)] ROI August 27, 1991

3. Two JAGMAN [Navy Judge Advocate General Manual] Investigations ROI dated February 7, 1991 and ROI dated December 17, 1991

4. Office of the Inspector General (OIG) Department of Defense Oversight review of the NCIS Investigation ROI dated June 5, 1996

5. FBI Behavioral Analysis Unit (BAU) Equivocal Death Investigation – ROI dated October 30, 2001 – SSA Mark Safarik

In addition, a VHS scene video tape, multiple copies of seventy eight (78) scene photographs (A-ZZZ), thirty nine (39) autopsy photographs (A-MM), and a single set of thirteen (13) x-rays were also provided to me for my work. My own report and analyses

Materials Tested

American Arms "Gentry" Side-by-side double barrel shotgun serial #504614
Winchester "Game Load" shot shells designed for dove and quail bird hunting, as well as other 12 gauge shotgun rounds of various charges and specifications

Appendix III

Drawings and Photographs from *Final Analysis Forensics*

[Hand-numbered Page 68-1 on]

Investigation Photographs

Investigation Documents & Notes

Letters & Correspondence


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MaleBedRoomggg copy.jpg


SceneDistantO copy.jpg


SceneDistantP copy.jpg


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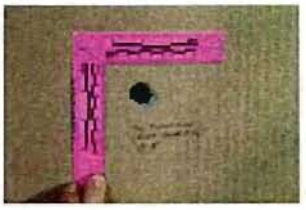
4shotFedR152 copy.jpg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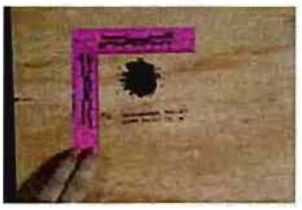
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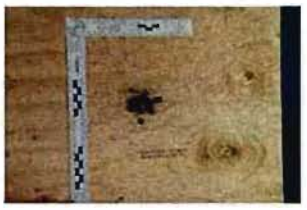
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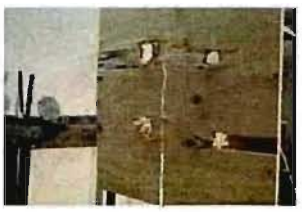
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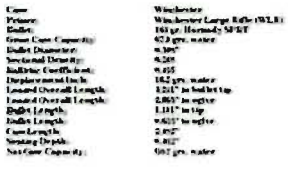
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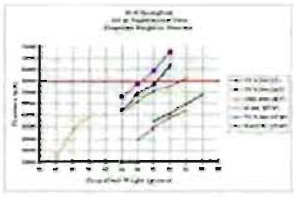
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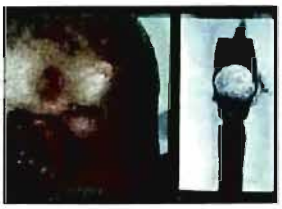
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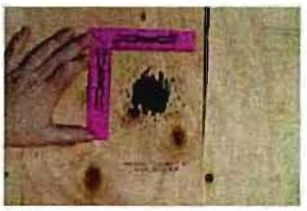
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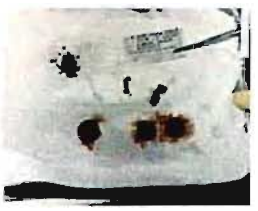
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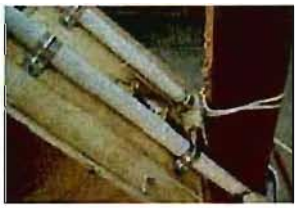
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Test2Shotfiredintact copy.jpg


Test2ShotfiredPost copy.jpg


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Test2SkullGunPrepBFront copy.jpg


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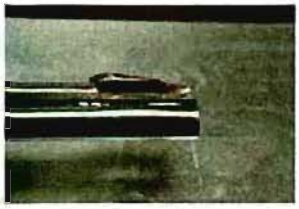
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Test3GunFloorStainB copy.jpg


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Test3GunStainB copy.jpg


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Test3MolivePrepB copy.jpg


Test3MolivePrepC copy.jpg


Test3ProneprepA copy.jpg


Test3ProneprepB copy.jpg


Test3ProneprepC copy.jpg


Test3ProneprepD copy.jpg


Test3SkullOpenA copy.jpg


Test3SkullOpenB copy.jpg


Test3SkullOpenC copy.jpg


TriggerPrepPhoto copy.jpg


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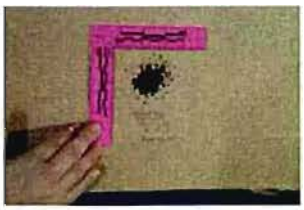
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WGameTargR copy.jpg


Win4Buck27L copy.jpg


Win4Buck27R copy.jpg


WinDoveQuailBackB copy.jpg


WinDoveQuailFrontA copy.jpg


WinGameLoadD&QL1 copy.jpg


WinGameLoadD&QL2 copy.jpg


WinGameLoadD&QR1 copy.jpg


WinGameLoadD&QR2 copy.jpg

Ithaca-SKB™ over & under, side by side, & gas-auto

Model 500.
12-, 20-gauge. Has shooting features described on preceding pages plus non-automatic safety, vent rib, Raybar® sight, barrel selector on trigger. Receiver features scrolled game scene. 20-gauge shoots 2¾" or 3" loads.

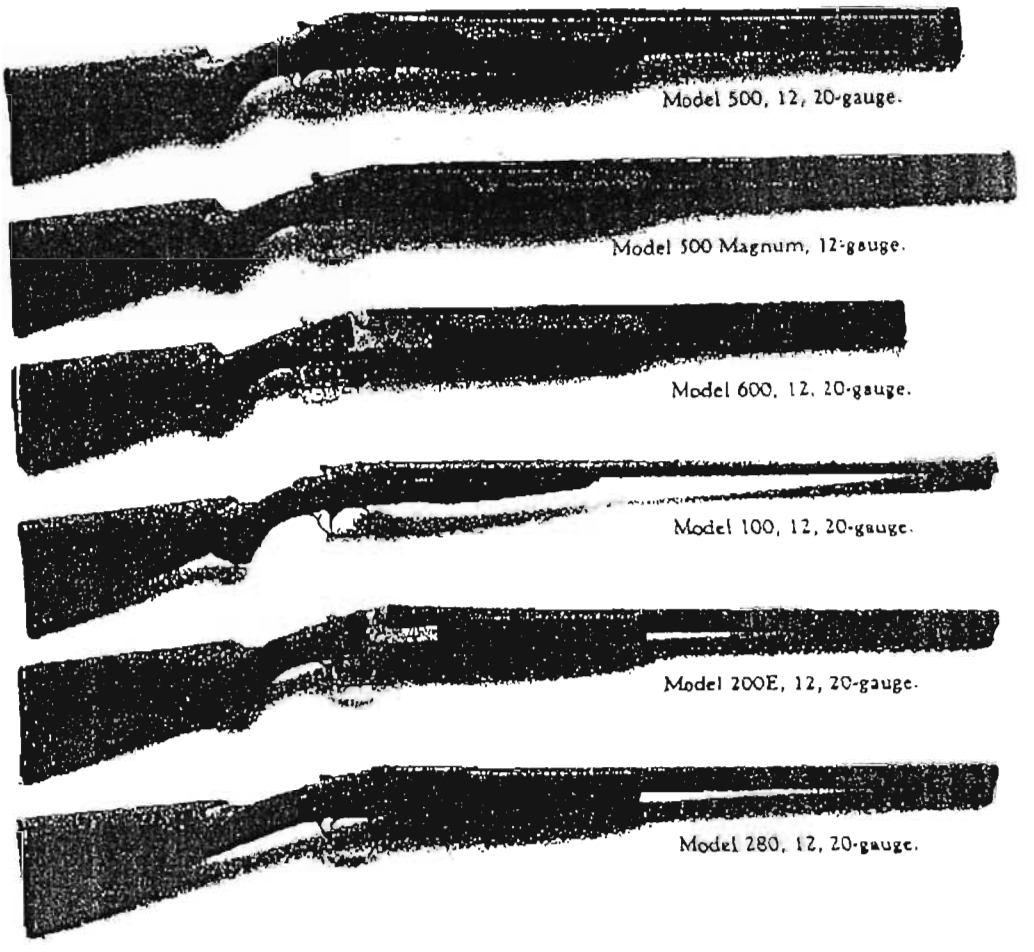
Model 500 Magnum.
Same as 500, 12-gauge, except chambered for 3" loads. Includes recoil pad.

Model 600.
12-, 20-gauge. Has shooting features described on preceding pages including trigger mounted barrel selector, non-automatic safety, vent rib, Raybar® sight. Has a finer grade of French walnut than Model 500. Frame is pure silver plated, elaborately scrolled. White spacers at pistol grip cap and butt. Middle bead sight. 20-gauge shoots 2¾", 3" loads.

Model 100.
12-, 20-gauge. Features double locking lugs to keep action shooting tight. Automatic safety, Raybar® sight, single selective trigger, and traditional extractors. Scrolled frame. 20-gauge shoots 2¾" or 3" loads.

Model 200E.
12-, 20-gauge. Same features as 100. Automatic selective ejectors, a finer grade of French walnut, beavertail forend. Extensively scrolled frame, silver finish. White spacers at butt and grip cap. 20-gauge shoots 2¾" and 3" loads.

Model 280.
12-, 20-gauge. Same shooting features as 200E, plus English style straight grip, beavertail forend with wrap-around hand checkering. Scrolled game scene on frame.
Note availability of special quail version choked Improved Cylinder/Improved Cylinder. 20-gauge shoots 2¾", 3" loads.



Model 500, 12, 20-gauge.

Model 500 Magnum, 12-gauge.

Model 600, 12, 20-gauge.

Model 100, 12, 20-gauge.

Model 200E, 12, 20-gauge.

Model 280, 12, 20-gauge.

SKB Field Grade Specifications

Model	Grade	Gauge	Chamber	Barrel Length	Choke	Length	Drop at Comb	Drop at Monte Carlo	Drop at Heel	Weight (lbs)	Suggested Retail Price**
500 & 600	Field	12	2¾"	30"	Full & Mod	14"	1½"		2½"	7½	M-500
		12	2¾"	28"	Full & Mod	14"	1½"		2½"	7¼	$449.95
		12	2¾"	26"	Mod & Imp Cyl	14"	1½"		2½"	7¼	
		20	3"	28"	Full & Mod	14"	1½"		2½"	6¼	M-600
		20	3"	26"	Mod & Imp Cyl	14"	1½"		2½"	6¼	549.95
500	Magnum	12	3"	30"	Full & Imp Mod	14"	1½"		2½"	8	469.95
100 & 200E	Field	12	2¾"	30"	Full & Mod	14"	1½"		2½"	7	M-100
		12	2¾"	28"	Full & Mod	14"	1½"		2½"	7	324.95
		12	2¾"	26"	Mod & Imp Cyl	14"	1½"		2½"	7	
		20	3"	28"	Full & Mod	14"	1½"		2½"	6	M-200E
		20	3"	25"	Mod & Imp Cyl	14"	1½"		2½"	6	449.95
280	English Field	12	2¾"	28"	Full & Mod	14"	1½"		2½"	7¼	
		12	2¾"	26"	Mod & Imp Cyl	14"	½"		2½"	7½	
		20	3"	28"	Full & Mod	14"	1½"		2½"	6½	464.95
		20	3"	25"	Mod & Imp Cyl	14"	1½"		2½"	6¼	
		20	3"	25"	Imp Cyl & Imp Cyl	14"	1½"		2½"	6¼	

SKB Target Grade Specifications

600	Trap	12	2¾"	30" or 32"	Full & Imp Mod	14½"	1½"		1½"	8	
600	Trap MC	12	2¾"	30" or 32"	Full & Imp Mod	14½"	1½"	1½"	2"	8	$559.95
600	Skeet	12	2¾"	26" or 28"	Skeet & Skeet	14"	1½"		2½"	7¼	
600	Skeet	20	2¾"	26" or 28"	Skeet & Skeet	14"	1½"		2½"	7	
600	Skeet	28	2¾"	28"	Skeet & Skeet	14"	1½"		2½"	7¼	559.95
600	Skeet	410	2½"	28"	Skeet & Skeet	14"	1½"		2½"	7¼	
600	Skeet Combo Set	20 28 410	2¾" 2¾" 2½"	28"	Skeet & Skeet	14"	1½"		2½"	7¼	1500.00
200E	Skeet	12	2¾"	26"	Skeet & Skeet	14"	1½"		2½"	7¼	
		20	2¾"	26"	Skeet & Skeet	14"	1½"		2½"	6¼	454.95

Draft

68-10

ITHACA MODEL 37 REPEATER SERIAL NUMBER LISTING by YEAR

Year		All Model Guns				
1937	1	to 3,600				
1938		to 10,000				
1939		to 18,350				
1940		to 34,400				
		Standard Model	**Solid Rib***	**Skeet***	**Trap***	
1941		to 50,900	70,000 to 71,500	80,000 to 80,400	88,000 to 88,150*	
1942		to 62,900	71,501 to 72,199	80,401 to 80,899		
World War II						
1945	62,901	to 69,999	72,200 to 73,150	80,900 to 81,899	88,150 to 88,300	
	90,000	to 115,350				
1947		to 157,150	73,150 to 74,700	81,900 to 82,499	88,300 to 88,760	
1948		to 202,950	74,701 to 78,300	82,500 to 83,414	88,065 to 89,619	
1949		to 302,500	78,301 to 79,999	83,415 to 83,964	89,620 to 89,989	
			Special Serial Number		310,000 to 310,099	
1950		to 348,000	Sequence For Solid Rib	83,965 to 83,999	310,100 to 310,179	
1951		to 413,000	Guns Discontinued	84,000 to 84,169	310,180 to 310,404	
1952		to 504,000		84,170 to 84,189	310,405 to 310,429	
1953		to 544,000		84,190 to 84,399	310,430 to 310,619	
				509,600 to 509,649	509,650 to 509,699	
		All Model Guns		**Model 37-S**	**Special Serial Number**	
1954		to 574,000		Discontinued after 1953	Sequence For 37-T	
1955		to 602,000			Guns Discontinued	
1956		to 652,000				
1957		to 704,000				
1958		to 727,000	*In 1941, the Company reserved blocks of serial numbers			
1959		to 759,000	for the Solid Rib model, the Skeet model and the Trap model.			
1960		to 777,000	The initial sequence for the Solid Rib model gun was 70,000 to 79,999.			
1961		to 797,000	80,000 to 89,999 for the Skeet model and 88,000 to 89,000			
1962	855000	to 820,000	for the Trap model. The special sequenses for the Solid Rib model was abandoned			
1963**	interchange	to 867,000	by 1949 when they were included in the general Pump listing.			
1964	BBL	to 891,000	The Trap model was returned to the general list by 1954 as the Target Grade.			
1965		to 927,000	The Skeet model was discontinued after 1953.			
1966		to 986,000				
1967		to 999,500				
1968		to 1,042,000	**Ithaca introduced interchangable barrels			
1969		to 371,091,500	commencing with serial number 855,000			
1970		to 371,150,500				
1971		to 371,211,500				
1972		to 371,275,000				
1973		to 371,339,000				
	381,000,001	to 381,030,000				
1974		to 371,405,500				
1975		to 371,517,500				
1976		to 371,596,000				
1977		to 371,626,000				
1978		to 371,646,000				
1979		to 371,678,000				
1980		to 371,709,000				
1981		to 371,728,100				
1982		to 371,758,700				
1983		to 371,850,800				
1984		to 371,871,600				
1985		to 371,882,000				
1986		to 371,889,000				

> 371,850,000 = 3" recvr

Gauge refers to the caliber of the shotgun. Except for the .410 gauge shotgun, gauge refers to the number of lead balls which will make a pound in the given bore of the involved weapon. As an example, in a 16 gauge weapon, it would take 16 lead balls to make a pound. Shotguns come in the following gauges and can be armed with the following listed ammunition:

Shotgun Gauge	Birdshot	Buck Shot	Mag Load	Slug Type
10 Actual 0.775"	BB 6 2 7.5 4 8 5 9	4		Foster

Shotgun Gauge	Birdshot	Buck Shot	Mag Load	Slug Type
12 Actual 0.729"	BB 6 2 7.5 4 8 5 9	1 4 0 00	1 4 00 000	Brenneke Sabot Foster

Shotgun Gauge	Birdshot	Buck Shot	Mag Load	Slug Type
16 Actual 0.662"	2 7.5 4 8 5 9 6	1		Brenneke Foster

Shotgun Gauge	Birdshot	Buck Shot	Mag Load	Slug Type
20 Actual 0.615"	2 6 4 7.5 5 9	3		Brenneke Foster

Slug Type	Mag Load	Buck Shot	Birdshot	Shotgun Gauge
			6 8 7.5 9	28 Actual 0.550"

Slug Type	Mag Load	Buck Shot	Birdshot	Shotgun Gauge
Foster			4 7.5 5 8 6 9	410 Actual 0.410"

SHOTGUN SLUGS

SABOT SLUG

GAUGE	WEIGHT
12 Ga.	440 grains

BRENNEKE SLUG

GAUGE	WEIGHT
12 Ga.	491 grains
16 Ga.	427 grains
20 Ga.	364 grains

FOSTER SLUG (Rifled Slug)

GAUGE	WEIGHT
10 Ga.	760 grains
12 Ga.	437 grains
16 Ga.	350 grains
20 Ga.	273 grains
410 Ga	87.5 grains

68-11

The following list involves birdshot and buckshot available for shotguns. Birdshot was designed to be utilized in hunting birds and small game. Buckshot was designed to be used in the hunting of larger game such as deer.

SHOTGUN AMMUNITION

Size	Descr. of Shot	Diam. (Inch)	Availability by Gauge	Grain Weight
•	12	.05		.18
•	11	.06		.25
•	10	.07		.50
•	9	.08	10 12 16 20 28 410	.75
•	8.5	.085		.88
•	8	.09	10 12 16 28 410	1.07
•	7.5	.095	10 12 16 20 28 410	1.25
•	6	.11	10 12 16 20 28 410	1.95

Diam (Inch)	Availability by Shotgun Gauge	Grain Weight	Descptn of Shot
.12	10 12 16 20 410	2.58	5 •
.13	10 12 16 20 410	20.6	4 •
.15	10 12 16 20	4.86	2 •
.18	10 12	8.75	BB •

BUCKSHOT AMMUNITION

Diam (Inch)	Availability By Shotgun Gauge	Grain Weight	Descrpt of Shot
.24	10 12 12 Mag	20.6	4 ●
.25	20	23.4	3 ●
.30	12 12 Mag 16	40.0	1 ●
.32	12	48.3	0 ●
.33	12 12 Mag	53.8	00 ●
.36	12 Mag	68.0	000 ●

Recoil Energy

Recoil energy is a function of the firearm recoil velccity which can be obtained from the expression:

$$V = \frac{M(B + 1.75 \times P)}{W(7000)}$$

Where:

V = velocity of firearm (feet/second)
M = muzzle velocity of bullet or shot (feet/second)
B = bullet or shot plus wad weight (grams)
P = weight of powder (grains)
W = weight of firearm (pounds)

Recoil energy can then be calculated from the general energy formula

$$E = \frac{MV^2}{2}$$

Where

M = mass of firearm
V = velocity of firearm.

Example: Given a .357 Magnum revolver weighing 2-3/8 pounds (loaded with five cartridges and a cartridge case) which just fired a 110 grain bullet at 1500 feet/second using 17.5 grains of powder.

Then:

$$V = \frac{1500(110 + 1.75 \times 1.75)}{2.375(7000)} = 12.7 \text{ feet/second}$$

$$E = \frac{2.375(12.7)(12.7)}{2(32.2)} = 5.9 \text{ foot-pounds}$$

68-14

Table 3 - Nominal Shot Pattern Diameters (Inches)

Choke	Amount of Constriction	Common Name	Range in yards						
			10	15	20	25	30	35	40
Cylinder bore	none	cylinder bore	19	26	32	38	44	51	57
Quarter choke	.010"	improved cylinder	15	20	26	32	38	44	51
Half choke	.020"	modified	12	16	20	26	32	38	46
Three-quarter choke	.030"	improved-modified	10	14	18	23	29	35	43
Full choke	.040"	full choke	9	12	16	21	26	32	40

68-15

Table 4 - Rifled Slug Characteristics

Gauge	Bore Diam.	Brand	Outside Diam.	Average Weight		# of Grooves and Angle
				Grams	Grains	
12	.729	Federal	.690	28.0	435	14 @ 15°
12	.729	Remington	.690	28.0	440	14 @ 9°
12	.729	Winchester	.725	28.0	437	14 @ 15°
16	.662	Federal	.635	23.0	355	12 @ 15°
16	.662	Remington	.655	23.5	365	14 @ 9°
16	.662	Winchester	.625	22.5	345	12 @ 15°
20	.615	Federal	.600	19.0	290	15 @ 15°
20	.615	Remington	.605	19.0	292	13 @ 9°
20	.615	Winchester	.611	21.0	328	15 @ 15°

68-16

Table 5 - Maximum Ranges for the Various Sizes of Shot (calculated from Journee's formula)

Shot Size	Diameter (inches)	Maximum Range (yards)	Shot Size	Diameter (inches)	Maximum Range (yards)
12	.05	110	2	.15	330
11	.06	132	Air rifle	.175	385
9	.08	176	BB	.18	396
8.5	.085	187	#4 Buck	.24	528
8	.09	198	#3 Buck	.25	550
7.5	.095	209	#1 Buck	.30	660
6	.11	242	#0 Buck	.32	704
5	.12	264	#00 Buck	.33	726
4	.13	286	#000 Buck	.36	792
Rifled Slugs	All Gauges	Approx. 1500 Yards			

Journee's formula gives the maximum range, in yards, as the product of the shot diameter, in inches, times 2200.

a0005

CRIME-SCENE MANAGEMENT, SYSTEMS

United States of America

J J Nordby, Final Analysis Forensics, Tacoma, WA, USA

s0005

Introduction

s0010

Importance

p0005

However "crime scene" is defined, it remains that only the crime scene provides physical evidence to establish the commission of a crime. Both witness statements and confessions remain mere hearsay accounts, which demand either support or refutation through some type of physical evidence. Without such physical evidence, whether direct or circumstantial, police investigators, medical examiners, forensic scientists, prosecutors, defense attorneys, and ultimately, the courts, would be left with little if any professional work to accomplish in criminal cases. For this reason alone, a systematic approach to any crime scene remains the most vital of all tasks facing criminal investigators in their sworn pursuit of justice, both for the victims of crime, and for those accused of its commission. Indeed, processing the crime scene remains the essential link between crime and science, giving both crime laboratories and medical examiners the necessary grist for their scientific mills.

s0015

Definition

p0010

Attempts to define crime scene often become mere enumerations of different types of crime scene by simple illustration. Such enumerations, while useful to help us classify different types of crime scenes, fail to provide a robust definition. Many have argued that "crime scene" represents a necessarily elastic notion with myriad instances and plural nuances, even some, perhaps, as yet unimagined. But some lexical definition, capturing both its essential link to physical evidence and its necessarily metamorphic nature, can be useful to help focus the roles of forensic science and forensic medicine in the investigation of physical evidence.

p0015

In the USA, the words "crime scene" are used to mean any identifiable physical location potentially supplying physical evidence relevant for adjudicating hypotheses concerning a given crime. While perhaps overly inclusive, this usage entails that appropriate crime scenes may include the entire forested area where a homicide victims body lies; any roads or trails providing access to the area; the body itself; the site where the victim met the perpetrator such as a vehicle, an apartment, a truck stop, or a bar; any site where the initial assault took place; and the site where the victim died: anything, in short, which supplies a location for existing physical evidence documenting the contact between victim and perpetrator. In common use, this may include the body, and items located near it – each being a mini crime scene unto itself.

p0020

This definition leaves the exact scope of the crime scene itself, that is, how much of the forested area, which roads, and which other sites, entirely to the individual investigator's professional discretion. In the USA, the exact nature and scope of specific crime scenes depend upon informed human judgments rather than upon lexical rigidity for both their physical and conceptual boundaries.

s0020

Scope

p0025

The definition entails that we may find crime scenes within crime scenes: each macroscopic crime scene contains multiple microscopic crime scenes, ranging from a bedroom to the victim's clothing to the microscopic traces on the clothing. While this may at times invite confusion by calling some strange locations crime scenes, it rests upon the most basic postulate of forensic science, Edmund Locard's principle of exchange – that every contact between two distinct items transfers part of one on to the other. In this manner, Locard's principle justifies the expectation of physical evidence at crime scenes and explains its potential significance.

s0025

Processing Crime Scenes

s0030

The Practical Preservation of Evidence

p0030

Before any physical evidence can be examined by forensic scientists, it must be recognized as potential evidence and, where relevant, collected and preserved in an uncontaminated state. This must occur during the initial crime-scene investigation since many such locations cannot be maintained under official control for indefinite periods. Crime scenes may involve public places, roadways, apartment buildings, or private homes, which exist to serve ongoing purposes precluding any sustained control by investigators.

p0035

They may be outdoors and subject to weather or other deleterious environmental effects, or they may involve temporally dependent evidence such as footprints in melting snow, muddy tire tracks in a rainstorm, or even odiferous vapor clouds which exist

only fleetingly. Nor do shrinking budgets and limited personnel resources permit the additional drains involved in the perpetual control of most typical crime scenes. This underscores the importance of documenting the crime scene to ensure its continued existence and thereby enable its continued investigation – representative notes, films, drawings, and collected evidence remain held under rigid protection in perpetuity.

s0035 **Crime-Scene Processing Personnel**

p0040 Practical problems and limitations also affect crime-scene processing among the many independent jurisdictions in the USA. A paucity of trained personnel provides a potential roadblock in the movement of evidence from the crime scene to the forensic laboratory or medical examiner's office. The lack of trained crime-scene personnel may even prevent the very recognition that a crime has been committed in the first place. Regardless of the scientific prowess of crime laboratory or medical personnel, if they fail to visit the crime scene to collect their own evidence, then they must depend upon the skills of the assigned crime-scene personnel for all the evidence that they examine. If crime-scene personnel fail to recognize the evidence, fail to collect it, or fail to collect it properly, then the operations of forensic science and forensic medicine, and the integrity of the justice system itself, suffer immeasurable damage.

p0045 As a remedy, crime-scene technicians, who are not trained forensic scientists or experienced forensic medical investigators, function simply to document the crime scene as thoroughly and completely as possible and to collect items of potential evidence according to one of many well-developed crime-scene processing protocols. Documentation protocols provide guidelines for measuring, drawing, photographing, and videotaping scenes while collection protocols provide guidelines to help uncover potential evidence, and, for example, to lift latent fingerprints and retrieve weapons, projectiles, cartridge cases, or blood and other biological evidence. They also teach the proper packaging and transporting of these items of physical evidence to the appropriate agencies, while preserving legal chain-of-evidence requirements, guaranteeing that the evidence remains protected and uncompromised.

s0040 **Processing Protocols**

p0050 In theory, with such protocols adopted, potential evidence has a better chance of being preserved. Of course one merit of the approach remains that only after considerable study does the scientist begin to distinguish significant from insignificant data. The practical merit allegedly remains the preservation of scarce budgetary and personnel resources by training lower-paid technicians to handle crime-scene processing. Advocates of this approach assume that the chance of significant data being both documented and collected outweighs the chance that data will be missed entirely, or even partially compromised by oversight or omission.

p0055 The practical effects of this overall management method remain an ongoing concern in the scientific investigation of crime and in the rigorous assessment of its evidence in courts of law. Many forensic professionals believe that quality crime-scene processing must be done by personnel more extensively trained in both the natural sciences and scene investigation. Given the multijurisdictional nature of investigative agencies processing crime scenes in the USA, the debate over alternative models of crime-scene management will not resolve soon. Nor will one particular approach emerge as "the standard" to be embraced by all jurisdictions regardless of size, location, or financial resources.

s0045 **Basic, General Stepwise Protocols**

s0050 First responders and securing the scene The protec- p0060 tion of a crime scene becomes law enforcement's first priority. The goal remains to prevent any accidental transfer of items to the scene, which may confuse or compromise the "slice in time" that the scene represents. Steps must be taken to keep unnecessary visitors away from the crime scene. Police establish physical barriers of some type to block entrance and to segregate the area from the public. Usually one officer becomes the scene security officer responsible for maintaining scene security.

p0065 No crime scene remains pristine – neither relatively protected indoor crime scenes, nor relatively exposed outdoor crime scenes. Seldom are crime-scene personnel the first to discover the scene. Even before the crime's discovery, proper first responders may include emergency medical technicians, firefighters, residents, relatives, hikers, mushroom pickers, construction workers, or even nonhuman visitors such as dogs, cats, mice, rats, birds, local fauna, and of course insects. Each visitor, regardless of scene, leaves some mark of his/her presence.

p0070 The official duty of securing the scene includes documenting who or what visited the scene as a so-called "first responder." (The documentation continues beyond first responders to include a visitor's sheet, recording the date and time that anyone, including crime-scene technicians, medical personnel, and detectives, enters or leaves the scene.) For many scenes, documenting first responders is handled by

collecting ambulance or firefighter run sheets, and by asking first responders to report their movements at the scene. If necessary, shoe prints, hair, clothing samples, blood, and even DNA may be collected for later laboratory elimination purposes.

p0075 The task becomes more complex when securing outdoor scenes. A scene involving a hiker's discovery of disarticulated skeletal remains, which has enjoyed varied company over some period of time, falls beyond the scope of such simple documentation. The hiker's movements must still be documented, but documenting the activities of other first responders requires the expertise of forensic anthropologists, forensic entomologists, and even forensic botanists.

p0080 As the data at crime scenes become more scientifically diverse, many processing protocols in the form of activity lists exhibit inherent shortcomings. Many scientific disciplines have a narrow focus, which remains unfamiliar to crime-scene technicians. The lack of specific scientific knowledge and experience can result in missing data otherwise available at such scenes, thereby inducing hardships upon investigators working the case.

p0085 Many crime-scene technician training programs cover the recognition, collection, and preservation of entomological and botanical data as well as information about the habits of indigenous birds, mammals, and fish. Some jurisdictions hire outside consultants to help with cases requiring specific and narrow expertise. Depending upon budget and cases, coroner's or medical examiner's offices may employ a forensic anthropologist to assist in the identification and recovery of human skeletal remains as well as to help law enforcement and the public distinguish human from nonhuman artifacts.

s0055 p0090 Human bodies as evidence In virtually all jurisdictions, the body of any deceased person and its scientific inspection remains the sole province of the coroner or the medical examiner. Human remains exist outside the crime-scene technician's province, despite popular television portrayals to the contrary. For this reason, the crime-scene technician is joined by a deputy coroner, medical examiner's representative, or a trained medical investigator. This representative may perform the duty of evidence recognition, documentation, and collection with respect to a human decedent. This evidence is then evaluated by the forensic pathologist to identify the decedent, and to establish both the cause and manner of death. Each official must work together closely and cooperatively for such a team effort to be both scientifically productive and legally successful.

p0095 Limitations to this medical version of the crime-scene technician become obvious when cases demand more of the medical technician than his/her lack of knowledge and experience can supply. Jurisdictions unable to afford trained medical investigators may simply function as a removal service, waiting until detectives release the body from the scene, and then merely transporting it to some preestablished location for analysis. The only personnel requirements for such positions appear to be a strong back and an equally strong stomach.

p0100 The legal and scientific prowess of such systems when faced with challenging cases remains at best questionable. As with crime-scene processing models, the best model to adopt for scientific death investigation remains a much-discussed topic among forensic professionals. However, in both areas, continuing education and robust educational requirements have led to promising certification programs designed to teach practitioners to seek help from those with more training and experience in relevant areas.

s0060 p0105 Survey the scene Once secured, with appropriate personnel in place, the next step involves some type of reconnoitering, or a "walk-through" to establish the scene's potential scope and peculiar working requirements. This involves both crime-scene and medical personnel who work together at the scene with detectives. The walk-through should establish basic parameters by noting each avenue of entry and exit, while specifically noting any hazards requiring supplemental measures, ranging from additional protective equipment to a call for additional security. The walk-through should provide a clear understanding of the equipment, personnel, and time required for the tasks at hand, and an initial prioritization of those tasks.

s0065 p0110 Document the scene Priorities for crime-scene processing depend both on the scene's peculiar circumstances and on the specific methods of various sciences. The general principle becomes to arrange the evidence-processing and collection activities from the least invasive or destructive to the most invasive or disruptive of the scene's current protected status. The most benign task becomes providing an accurate documentation of the entire scene as it initially presents itself to investigators.

p0115 This remains the most important step to aid future analysis of the scene's elements when various investigative hypotheses are formed and tested. Usually elements not believed to be relevant at the scene may become supremely relevant later on as further information develops. Thus the proper, complete, and

orderly documentation of the crime scene becomes the primary task for the crime-scene technician.

s0070 p0120 *The forms of documentation* This documentation assumes several forms. "Notes" cover data from listing personnel, notification, and arrival times to a thorough description of key scene elements ranging from the victim to the surrounding environs, including the structure, its furniture, and even the contents of ashtrays, refrigerators, and dressers. The notes must follow a clear, logical order, usually moving from descriptions of the larger toward details of the smaller; or from the overall to the specific depending upon the scene. The same logical principles apply regardless of whether the crime scene is in the woods, or in a housing project.

p0125 "Measurements and both rough and scale drawings" are developed to map the scene, giving detailed numerical distance relationships among items in three-dimensional space. A crime scene is not flat: coordinate systems with x-, y-, and z-axes are most practically used to locate items in space and capture their essential features. While not commonly used, three-dimensional coordinate systems are powerful tools in the analysis and documentation of, for example, blood stains or bullet holes which necessarily occur at some height as well as at some two-dimensionally fixed location.

p0130 Three basic measurement methods for locating items two-dimensionally include triangulation (locating an object by measuring its distance from two fixed points), baseline (locating an object by measuring its distance at 90° from a straight line between two fixed points), and polar coordinate methods (locating an object using a transit or compass by determining its north–south–east–west angle and distance from a fixed point). The choice depends upon the nature of the scene and the ease with which items can be relocated in the same space years after the scene has been abandoned. Each method identifies two fixed starting points judged to be relatively permanent in both nature and location, and develops the corresponding locations of all evidence in specific relation to these two fixed points.

p0135 "Videotape photography" also captures the scene according to these logical principles, for example, noting roads, orienting north–south–east–west directions, the weather, time, temperature, and other physical phenomena. No detail at the scene can be considered inconsequential or unworthy of inclusion in the taped record. The videotape of a crime scene does not include an audio track. Such a track might inadvertently record irrelevant comments by investigators, not properly a record of the scene itself. Exceptions might include the need to record unusual noises or sounds, which are an integral part of its nature, and therefore must be included for a complete understanding of its varied elements.

p0140 "Still photography" must capture the entire scene, again moving from overall shots showing the orientation of various items toward specific, examination-quality photos documenting each element. Standard practice captures items first without identifying numbers or measuring devices, then with such identifiers and scales present. A consistent numbering or lettering system identifies the items in both photos and drawings. Systems usually come as "tents," like triangular signboards, with numbers or letters in black script on a white or yellow background. Long after items of evidence are collected, these numbers, visible in the photos, provide an orientation of the item along with other items of evidence similarly documented at the scene.

s0075 p0145 Evidence discovery and collection Disciplined scene searches help ensure that no items of potential significance are missed as the crime-scene processing progresses. Different search techniques, such as establishing a logical linkage among items, line searches, zone searches, and wheel, spiral, or grid searches, can be applied, depending upon the type of location being processed. In many cases, logical linkages among items provide the most useful approach. For example, if six spent cartridge cases appear at a scene, the linkage search technique implies that investigators search for evidence of six bullets and their associated trajectories at the scene. Even if six bullets cannot be accounted for, this too provides useful information about the crime which must be considered in any eventual reconstruction of events leaving these effects.

p0150 Other search patterns are based upon geometric patterns: some, such as the line search, may apply more usefully to larger outdoor scenes. Often some combinations of these search techniques develop as a reasoned response to the peculiarities of the specific situation under investigation. The choice of technique remains part of a thoughtful response to the uniqueness of the specific scene and there is no single search pattern that can be applied blindly in all circumstances. Search techniques as basic tools of crime-scene processing are chosen by investigators to best attain the objectives dictated by the case at hand.

p0155 Once the scene has been revealed as completely as possible, evidence collection and preservation techniques remove items of evidence for further analyses, to be completed by specialists, usually in the crime laboratory. While there is no rigid order for the collection of evidence, usually the most fragile, easily lost, and transient items are first collected. This ensures that

such items remain uncontaminated. Different types of evidence require different collection and packaging techniques.

p0160 Collection principles are based upon the logic mirrored in search patterns. For example, fingerprints are lifted from various surfaces which are chosen based on logical linkages – one might ask, for instance, which surfaces would be touched by anyone gaining entry to the scene and producing the effects observed during the scene's investigation? These locations, then, provide the most logical places to attempt latent fingerprint lifts. If all surfaces at a crime scene were blindly dusted for prints, little else would be accomplished. Sound evidence collection depends vitally upon the logical sagacity of the crime-scene technician working the scene.

p0165 Once collected, evidence must be consistently marked, packaged, and sealed to avoid contamination and to preserve the chain of custody. Usually one person is assigned evidence collection and packaging responsibilities. This ensures uniformity and consistency, while preventing needless duplication of effort if each investigator collected evidence independently. Packaging is chosen to best preserve the evidence. For example, bloody evidence is sealed in paper bags to allow the items to dry and to prevent deterioration of the evidence by condensation, or biological activity, which would be encouraged if such items were sealed in plastic. In appropriate packaging, the items are sealed with evidence tape, documented in the evidence log with their number and a brief description, and then signed and dated by the collection technician.

p0170 Whenever packaged evidence is opened and examined by laboratory or other personnel, the item is resealed using the identical protocol – it is resealed with evidence tape, resigned, and redated by the new analyst. This ensures that chain of custody is preserved by providing a record of the item's disposition at all times, under all circumstances. While much of this scientific analysis occurs away from the actual crime scene, some types of evidence may require that the forensic scientist conduct his/her analyses at the crime scene itself.

s0080 ### Scientific Evidence Analysis at Crime Scenes

p0175 In most cases, crime-scene personnel are thought to have the training needed to document all scene data, if not to provide the scientific analysis and interpretation of its significance. However some data at crime scenes may demand that trained scientists (with expertise beyond that of the crime-scene technician) visit the scene in order to provide a scientific analysis of data, which cannot easily be separated from the location. In these cases, trained forensic scientists or forensic pathologists must visit the crime scene in order to provide their analyses and interpretations and to release crime-scene technicians from difficult, if not impossible, documentations needlessly risking the inadvertent distortion of valuable data.

Crime-Scene or Event Reconstruction

s0085

Characterization

s0090

p0180 An anecdotal recitation of personal opinion, regardless of source, is not a crime-scene reconstruction. A properly developed crime-scene reconstruction links a series of scientific explanations to illuminate the events leaving physical evidence. This process involves proposing, testing, and evaluating explanatory connections among the physical evidence related to these events. The purpose of the analysis is to determine their best explanation.

Example

s0095

p0185 Upon entering a room, one sees a yellowish-fluid puddle on the white linoleum floor. A small puppy wiggles submissively as it runs up to greet you at the room's entrance. The logic relevant to crime-scene reconstruction also licenses an explanation of the puddle on the floor. The scientific process involves discovering evidence to support or refute your proposed claim. The same logical process justifies more scientifically complex crime-scene reconstructions. While no reconstruction can explain every element of a scene, the explanations must minimally withstand sustained logical and scientific scrutiny.

Conclusions

s0100

p0190 As important as the crime scene remains in the investigation of crime, often scant attention is paid in the USA to the need for a systematic approach to crime-scene management, processing, and documentation. No better evidence can be supplied than to examine the miniscule budgets for training crime-scene technicians, crime laboratory personnel, medical examiner's personnel, or especially, for training police officers both in the basics of crime-scene protocols, and in the scope and limit of current forensic science and forensic medical practice. Much misinformation exists among law enforcement personnel concerning forensic enterprises ranging from fingerprints and their significance to DNA and its limitations. Improved training provides the best remedy.

p0195 Often the quality of equipment available to actors playing forensic scientists on television far exceeds the

equipment available to real scientists and technicians charged with processing and documenting actual crime scenes. Until these matters change significantly, crime-scene processing will continue to lack substantial uniformity and will remain of varying quality among the many jurisdictions charged with this vital task in the USA.

See Also

Crime-scene Management, Systems: United Kingdom (00084); Continental Europe (00085)

Further Reading

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CHAPTER XX

MEASUREMENT OF TEMPERATURE

A rational analysis of interior ballistics requires a knowledge of the temperature. At the present time, the only reliable method for determining powder flame temperature is by a calculation by means of a heat and material balance. There are several reasons why it is not an easy matter to measure flame temperature.

In the first place, measuring instruments of the thermometer or thermocouple type consist of solid elements which are immersed in the hot flame and which are supposed to reach the temperature of that flame in order to actuate some sort of indicating device. If the flame is of sufficiently long duration and if the thermometer were to be left in it indefinitely, it might be supposed that the thermometer would reach flame temperature. This is not the case except under very special conditions. The usual result is that the thermometer will reach a final equilibrium temperature between the temperature of the flame and the temperature of the surrounding walls. This is due to radiation effects between hot solids through gases that are transparent to radiant heat. Thus, if the powder gases are at 3000°C. and the surrounding walls are at 1000°C., the thermometer might read in the vicinity of 2000°C. ±, depending on the degree of turbulence of the hot gases. The only case in which the thermometer will read the true gas temperature is the rare one in which the gas and the surrounding walls are all at the same temperature.

But in the case of flames from the explosion of powder the time interval is very short, and, because the thermometer must receive heat in order to become heated up to its final temperature, the time element enters into the picture. The result is that the thermometer never has a chance to reach its theoretical equilibrium temperature, its degree of failure to do so depending on the duration of the flame itself.

Several methods have been used to approximate explosion flame temperatures. One device consists of a rotating disk on the rim of which is placed a thermocouple junction. This disk

is then whirled at known speed through a continuous gas burner flame of known temperature at such a speed that the time interval in contact with the flame corresponds to the duration of an explosion flame. The thermocouple reading under these conditions is an approximate value for the burner flame. Such a device, calibrated in this way, has been used to measure the temperatures of the flames from primers with some success.

Another method for measuring steady flame temperatures of long duration is the sodium-D-line reversal method. In this method the light from a tungsten-filament (or platinum-filament) incandescent lamp is led through the flame in question on the way to the spectroscope. The D line will appear as a bright line on a continuous spectrum if the flame is hotter than the filament and as a dark line if the flame is colder than the filament. The temperature of the filament is then adjusted by electrical means until the D line just disappears, at which point it and the flame have the same temperature. The temperature of the filament is then measured by means of an optical pyrometer, which gives its correct temperature.

This method has been used for flames of short duration by taking a motion-picture film of the spectrum and adjusting the filament temperature by trial and error for successive firings until the proper temperature has been reached.

The results of experiments on powders burning by combustion in the open air by the D-line method are given below:

TABLE 21

Name of Powder	Temperature, °C.
.30-caliber pyro (P.A. 375)	2000
12-in. cannon powder (D.P. 765)	1880
American Powder Mills black powder (FFG)	2700

The Thermodynamics of Firearms
By Clark Shove Robinson
MIT
McGraw-Hill, Inc. N.Y.
1943

CHAPTER XIX

MEASUREMENT OF PRESSURE

The measurement of steady pressures offers few or no difficulties. Variable pressures are increasingly difficult to measure —the greater the rate of change of pressure with respect to time, the greater the difficulty—and in the case of guns and closed chambers, the difficulty becomes very great indeed.

The classical method for measuring the pressure in guns and closed chambers is the copper crusher gauge method. This method makes use of a small copper cylinder of known dimensions; this is placed in a container holding a piston, and the whole is placed in the powder chamber. When the charge is fired, the compressed gas applies pressure to the piston, which in turn compresses the copper cylinder beyond its elastic limit. After firing, the cylinder is measured, and the degree of compression is supposed to be proportional to the maximum pressure in the chamber. The device is calibrated by a static-pressure device to give the proper reading. This method fails to tell the truth, however, for stressing the metal beyond its elastic limit causes plastic flow, and flow of any variety requires time. When the charge is fired in the gun, the time interval is so short that the metal does not have an opportunity to flow so far as it should for the pressure applied and the result is that the gauge records too low a pressure. Recent experiments on the effect of rate of loading on copper crusher gauges have indicated that at a maximum pressure of 30,000 lb. per sq. in. the error in the instantaneous application of load on a gauge calibrated by the static method is 7 per cent, the gauge reading about 27,900 lb. per sq. in. Another difficulty with the crusher gauge is the compression of the wall of the tube through which the piston moves, causing it to stick and thereby reduce the pressure reading still further. It should be remembered, however, that successive gauge readings on similar guns should have values which are correct relative to each other, even if they are in error on an absolute basis.

The time lag in recording pressure gauges for guns and closed chambers is equally a serious problem. The duration of pressure in a gun is frequently of the order of magnitude of 5/1,000 to 20/1,000 sec., while in a closed chamber the duration of the rise in pressure is often considerably shorter than this. To be of real value in ballistic calculations, the pressure lag should be less than 1/1,000 sec.

There are two satisfactory methods in use at the present time for recording pressures. The first of these is the piezoelectric gauge. This gauge depends on the property of certain crystals, notably quartz, of generating a flow of electricity when pressure is applied to it in a certain direction. The amount of electricity generated is proportional to the rate of application of the pressure; and if this amount is measured by a suitable chronograph, the record should therefore be a function of the pressure-time curve desired. It requires some sort of amplifying device to magnify the reading to make it measurable, the most successful device at present used for this purpose being the cathode-ray oscillograph. Present instruments of this type have very little inertia and a time lag of about one-millionth of a second.

The second method in use is the Petavel mechanical, or spring, gauge. This device makes use of two metal springs in the form of steel tubes, one of which is under compression and the other under tension. These are stressed well within their elastic limits so that the strain is proportional to the pressure. The movement of the end of the spring is recorded by means of a mirror attached to it, which deflects a beam of light. The deflection is recorded on the sensitized paper of a chronograph and is proportional to the pressure. While this device has a certain amount of time lag, it seems possible to build this type so that it is extremely rapid; times of explosion of the order of magnitude of 1.5 milliseconds have been successfully measured by one of these gauges.

Ibid.

42-24

68-25

NAVAL INVESTIGATIVE SERV

FORENSIC EXAMINATION REQUEST

To: NISRFL Attn: Firearms / Toolmark Division	From: Naval Investigative Service Resident Agency EL TORO, BLDG #29 MCAS EL TORO SANTA ANA, CA 92709-5006

Brief description of case facts which would pertain to the requested examination and which may assist laboratory personnel in processing the evidence. Include date and place of crime.
On 22Jan91 between 0815-0945 V/Shadow, James E. COL USMC (deceased) was discovered by (b)(6),(b)(7)(C) lying out in their backyard of their on-base quarters the apparent victim of a self inflicted shotgun blast to the head. According to (b)(6),(b)(7)(C) was distraught over being recently accused of abusing his power and position by the Marine Corps. No suicide note was found.

Evidence Submitted

Item No.		Item Description
014-91	(A)	Ithaca 12g. shotgun
	(B)	gun shot residue kit
	(C)	expended 12g. dove/quail shell.

Examinations and/or comparisons requested:
Conduct examinations on item (A) for operational malfunctions number of pounds of pressure necessary to pull trigger, examine barrel for blow back material (biological). Conduct an analysis of shotgun residue contained in item (B). Conduct comparative analysis of firing pin in item (A) to mark left on item (C). cont on 2ND pdg.

Full name of suspect(s):

Full name of victim(s): V/SHADOW, JAMES EMERY / COL USMC (DECEASED)

Type of offense: DEATH

One copy of evidence custody document enclosed? Yes ✓ No ____

Other evidence previously submitted for this case? Yes ____ No ✓
If yes, list lab report number: ____

NIS Case Control Number: 22JAN91-11ET-0021-7HMA

Investigators name: (b)(6),(b)(7)(C) COM: (b)(6),(b)(7)(C) Office telephone: AV: 365-4198

Disposition of evidence after analysis/comparison:

Item No.		Disposition
014-91	A, B & C	return to NISRA EL TORO
015-91	C & E	" " " " "
016-91	A	" " " " "
017-91	A & B	" " " " "
018-91	A	" " " " "

Considered priority of requested examinations: Urgent ____ As soon as possible ✓ Routine ____

The above mentioned evidence has not been subjected to examination by other experts for the prosecution in the same scientific field as requested herein.

Name of requestor: (b)(6),(b)(7)(C) Date of request 25JAN91

(b)(6),(b)(7)(C)

V/ [illegible]ON, JAMES EMERY/COL USMC
2[illegible]91-11ET-0021-7HMA
68-26

Questioned Document Division:

Evidence:

015-91 (C) writing tablet and pencil
(E) [illegible] note pad

Exam requested:

Attempt to locate any indented writings on items (C) and (E).

Photographic Division:

Evidence:

017-91 item (A) terry cloth robe
item (B) white undershirt

Exam requested:

Conduct close-up photographs of items (A) and (B) concentrating on blood stained areas.

end of request.

VICABOW, JAMES EMERY/CCR
Jan91-11ET-0021-7HMA

68-27

Latent fingerprint Division:

Evidence

014-91 Item (A) Ithaca 12 g. shotgun
Item (C) expended 12 g. shell.
018-91 Item (A) rolled prints for V/Salow

Exam requested.

Determine if any identifiable latent prints are on. the trigger of item (A) (shotgun), and item (a) (expended 12 g shell) and compare to # 018-91 item (A) (rolled prints for V/Salow).

Evidence.

016-91 (A) box of ammo

Exam requested.

Determine if boxes of Winchester 12 g. dove and quail shotgun shells in item (A) (ammo) contain latent prints. Compare any developed prints to 018-91, item (A) (rolled prints for V/Salow).

Cont on page 3.

Bill PROPER, Ithaca Gun Co.

? SKB Side by side {1975 / 1980
200E 137911

Japan
forged barrels — or drawn

Model 200E — single Triggers made in Japan
serial #S don't mean much if it is a
200E, then it has a single trigger and
was made in the late 1970's or early 1980's.
If it has a double triggers, then it is an
earlier gun (per Tom Pietrini) comm.
former State Trooper.

NIS - NCIS — failure to document weapon
photographically; or to provide accurate
data on model 200E? or barrel:
Damascus barrel? or forged? choke?
full, Improved Cyl. (IC/Mod) modified,
or none?
last 1½" of the barrel rec is location of
choke - look past that for blood/tissue
etc. — in both fired & unfired barrels.

NIS — poor doc. job of weapon w/ contradictory
information + lack of DRS's coop.
make assessment challenging at best.

TOM PIETRINI connect. Gunshop:
Southbury Trading Post
102 PLAYHOUSE CORNER
Southbury CT. 06488

- PMC — black powder — low zip shot
  1925 - paper cartridge
  Smokeless powder still in paper

- cardboard — wad & paper from end wads

  black powder — breaches

- cart. cases — Type Black Powder?
  1991 — acid shot.
  {WW 12 D
  or scan mark}

10-23-04 SA60W - Ballistics Testing Page 1 of 2

06/12/2004 $18.99 Objective: discover circumstances consistent (logically) w/ data observed @ scene via photos, video, autopsy & analysis of shells & BPA

06/12/2004 $18.99 additional MISC LAB Expenses

06/12/2004 $18.99 color - gel

8.25 color - gel

check # FAF (CASH PRICE) American arms gentry serial # 504614 - $1550.00 will do for $895.00 cash price w/ Transfer 35.00 @ Blaze Shop check options - Permit issues too

John Awtrey - 703-696-0846
cell 703-919-[illegible] 12 62

10-27-04 Target construction
Victim: 71" tall
chair: 17" +/- from ground
vict.: seated on edge of chair - leaning forward

Staple gun - Staples	fasteners
Trash bags	saddle blocks
Digital media - 8mm	posts
Digital media - 35mm	Duck Tape
Bath robes	Shrinkwrap
sheets	foil
gloves	foam insulboard
plywood	roll foam
insulation	phone books

materials - cont.

shot shells:

12	Oz	Sizes			
		4	5	6	7½
P128	1⅛	152		253	394
P138	1⅜	186	234	309	

1. 2¾ 12 gauge : Hornaday 12g. 300gr. (Slug)
2. 2¾ 12 g Federal 12g. 3 dram eq. "00" = 9
3. 2¾ 12 g Winchester 12g "4 Buck" = 27
4. 2¾ 12 g Federal 12g #4 - 1⅛ oz = 152
5. 2¾ 12 g Fiocchi ¾ DRAM EQU. 12g #7½ - 1oz = 383
6. 2¾ 12g TARGET Winchester 12g #9 - 1oz =
(7) 2¾ 12g. ACTUAL
Winchester Dove & Quail game load

Test - Black Powder (lower power per dram equiv. than modern smokeless powder

example: 12g. & shot 7/8 oz shot 2¾ dram Eq.

A. Targets - PAPER (note spread as well as damage)

1. Game load - winchester into paper @ 8'
   a) 2¾ - 1 - 7½ into paper @ 8' min. recoil (left)
   b) into paper @ 8' min recoil (right)
2. "00" Buck load - Federal into paper @ 8'
   a) "00" - 9 into paper @ 8' some recoil (left)
   b) "00" - 9 into paper @ 8' some recoil (right)
3. "4 Buck" load - Winchester into paper @ 8' (27 pellets)
   a) "4 Buck" @ 8' recoil (left) (greater choke)
   b) "4 Buck" @ 8' recoil (right) (lesser choke)

A targets:
Shot shells — cont.

4. #4 - 1 1/8 oz - 152 pellets @ 8' paper Federal
   a) #4 Federal - recoil Left - greater choke
   b) #4 Federal - recoil right - lesser choke

5. 12g. Slug Federal Classic
   a) Right barrel only — no spread - Slug into paper @ 8'
   (no b) n/A

6. Winchester Target/game Load light (Lite)
   a) left barrel @ 8' (lesser spread
   b) right barrel @ 8' (greater spread)

B. Targets - PLYWOOD (note damage varies)

1. Dove & Quail game load @ 8' into 1/2" PLY
   a) 2 3/4 - 1 - 7 1/2 left @ 8' choke less D.
   b) 2 3/4 - 1 - 7 1/2 Right @ 8' less choke spread

2. "00" Buck @ 8'
   a) left
   b) right
3. "4 buck" - 27 pellets
   a) left
   b) right
4. #4 - 1 1/8 oz - 152 pellets
   a) left
   b) right

B targets:
Shotshells – cont.

5. Dlg. Slug (Federal)
   a) Rt. barrel only)
   b) N/A

6. Winchester Target/game/load side
   a) Right – no choke
   b) Left – choke

C. ACTUAL AMMO TESTING – TARGETS

1. Plywood cont. w/ Winchester game formerly "dove & quail"
   a) Left
   b) Right

2. "Skull Box" FORCES STUDY
   a) left barrel – only TEST 1
      actual "dove & quail" "game round" thought to be equivalent.

      Result: material into both fired & unfired barrels; fluid & tissue gel through nose-holes – around barrelhole forces pushed fluid-tissue down – exit through pipe – picture of box – major tissue/fluid would have gone into chest cavity/thorax

C: Actual
Skull boxes cont.

b). left barrel Federal 12 #8 shot 7/8 oz 2 3/4 dram black powd

WADS PLASTIC VS ? | Testing "cowboy rounds" black powder given results in autopsy photo - not comas: w/ modern smokeless powder.

2' – paper target cowboy rounds 12g. 2 3/4" – 7/8 – 8 Federal

a) left } both COWBOY RDS none plastic
b) right } cups & WADS (photos taken VS Win Dove)

c) left barrel Federal #4 shot 1 1/8 oz 12g.
Skull box TEST #2
left

d) Skull box TEST #3 (ABORT?) barrel?
left — AB damage @ contact - repair

E) Skull box TEST #4 (after repairs)
left.

(2g) gloves – GSR TESTS:
a) win "DEQ" gloves x L&R (Left Bar)
b) Fed. "COWBOY" gloves x L&R (Right b.)

prints – done in lab

SKB Field GRADE SPECS) 200E: 1970's 1980's

Ithaca 200E 12 gauge 2 3/4" chamber 26" barrels had a Mod (1) & Imp. Cyl. (2)

6 significant features: barrel length
- Choke type
- Ammunition type (independent of shotgun)

* except for Remington barrel issue of safety

⊙ drop in comb = 1½" drop @ heel = 2 5/8"
length = 14"
Wt. = 7 lbs

STAND-IN SHOTGUN FOR TESTING

⊙ Relevant Features of 200E & AM. ARMS GENTRY

barrel length = 26" comb drop heel drop C-length 14"
Choke: Left B Choke: Right B Weight = 7
Trigger Type — single selector switch
Overall length = 43 3/4" muzzle to top STOCK-PAD
SERIAL # 504614 American Arms INC.
N.K.C. MO; made in Spain
GENTRY - 12 GA - 3"

10/20/04

68-36

El TORO CA Jurisdiction in 1989 - BRAD GATES

Orange county S/ Coroner
550 N. Flower ST.
Santa Ana CA 92701

no good [714-834-3012]

BRAD GATES Still in office in 1991

1071 W Santa ANA BLVD
Santa ANA CA 92703
locate office?

714-834-3075
Vernon Gode

case # 91-00474-54
Aruna Singhania, MD
01/24/91

View:
a) Cervical/spinal cord specimin
Cervical cord C-1 — C4
fibers (intact, or not?)
b) medulla sample/histology of lungs
c) lung/brain histopath.
d) Projectile/lead recovered
specimen / shot-shell evidence

called 10-22-04 1400 hrs

Critical Aspects : Death Invest. SABOW

charge : "not properly invest."

errors always discoverable in any invest.
errors were made in forensic areas :

documentation :

- nothing of right hand (photos etc.)
- nothing of weapon - inside or remaining shell
- nothing of weapon interior (barrels ~~108~~ tissue, etc.
- feet & lower extremities
- stock of shotgun
- grass surface for stock defect / dent
- grass surface for blood stains & poss. DC blood volume

autopsy : description "masked inference / language is always an issue; Dut description, if complete, will eliminate ambiguity : overstatement of some artifacts

- "pulpafied" brain stem / brain — not quite massive injury did not reduce brain or medulla to liquid
- skull fractures "depressed" vs "displaced" carry connotations which may mislead or confuse
- "aspirated" blood in lung " is not descriptive, but a conclusion

Evidence handling :

- scene handling of weapon / removal of shells

none of "errors" committed, some even noted in retrospect. could not be overcome and did not prevent reaching a rationally justified conclusion re: Col. Sabow's death.

Errors must be addressed when they raise questions — if they can be answered, there should be an attempt made.

This work document that attempt.

Final Analysis Forensics

Death Investigation *Criminalistics* *Forensic Analysis*

DATE: August 10, 2004
TO: Dr. David Sabow, MD, PO Box 5518, Rapid City SD 57709
FROM: Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics
3532 Soundview Drive West
University Place WA 98466-1426
RE: Case #04-0514

COPY

Dear Dr. Sabow,

I understand from our conversations that you possess evidence relevant to my scientific investigation of your brother's tragic death. I request that you send this evidence to my laboratory in University Place Washington at the address below for scientific analysis. In particular, I would appreciate your cooperation in receiving the Ithaca side-by-side 12 gauge shot gun instrumental in your brother's death. If you still have any of the original Winchester Duck and Quail 12 gauge rounds, I would also appreciate the chance to examine them. Of course I will return all materials to you as soon as my analyses are complete. I hope to be finished by October 30, 2004, and you will have the material returned by that date.

You also mentioned a *PowerPoint* presentation of this evidence, which I would also appreciate the opportunity to review. I would also be happy to have you present this data to me in any form you might find convenient. As you know, I must consider all the available relevant scientific evidence in my reviews and analyses of this case in order to present the best scientific explanation of Col. Sabow's tragic death.

I want to assure you that I retain a dedicated passion for discovering and supporting the true explanation of your brother's death, whatever that may entail, popular or otherwise. My sole purpose is to present the best scientific and factual explanation allowed by this evidence. That may mean concluding that this evidence remains ambiguous and therefore supports no firm conclusion one way or the other. As you know, I remain steadfastly unmoved by external pressures of any sort regardless of source, whether real or perceived. I maintain an open, but not an empty mind.

Thank you so much for your help and cooperation in this matter. I look forward to receiving these materials at your earliest convenience and sharing my results with you when my report is completed.

Sincerely,

Jon J. Nordby, Ph.D., D-ABMDI
Consultant in Forensic Science & Forensic Medicine
Final Analysis Forensics
finalanalysis@msn.com
www.finalanalysisforensics.com

Laboratory/Offices 253-627-2739

CONFIDENTIAL

Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

TO: Jack L. Feldman, Ph.D.
Professor of Neuroscience
Dept. of Physiological Science
University of California, Los Angeles
405 Hilgard Ave.
Los Angeles, CA 90024-1527

COPY

FROM: Jon J. Nordby, Ph.D., D-ABMDI, Consultant in Forensic Science & Forensic Medicine

RE: Request for your assistance with the independent reinvestigation of Colonel James E. Sabow's death on January 22, 1991

DATE: September 29, 2004

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University Place, WA 98466-1426

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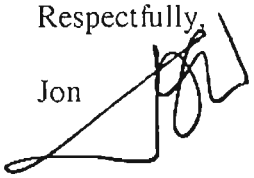
Respectfully,

Jon



Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

68-42

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Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

TO: Dr. Kent B. Remley, MD
Professor of Radiology and Otolaryngology
Dept. of Radiology, Neuroradiology Section
University of Minnesota School of Medicine
Box 292
420 Delaware Street, SE
Minneapolis MN 55455

COPY

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Respectfully,

Jon

Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

68-44

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Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

TO: Dr. David Rubinstein, MD
Professor of Radiology
University of Colorado Hospital
Dept. of Radiology MRI/CT
Campus Box A-034
4200 East Ninth Ave.
Denver CO 80262

COPY

FROM: Jon J. Nordby, Ph.D., D-ABMDI, Consultant in Forensic Science & Forensic Medicine

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DATE: September 29, 2004

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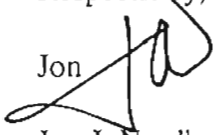
Jon



Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

68-46

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Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

TO: Dr. Martin L. Fackler, MD, F.A.C.S.
RR 4 Box 264
Hawthorne, FL 32640

COPY

FROM: Jon J. Nordby, Ph.D., D-ABMDI, Consultant in Forensic Science & Forensic Medicine

RE: Request for your assistance with the independent reinvestigation of Colonel James E. Sabow's death on January 22, 1991

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Jon

Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

68-48

CONFIDENTIAL

Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

TO: Mr. Antonio Verducci
Civilian Human Resources
Washington Navy Yard
614 Sicard, SE
Washington DC 20376

COPY

FROM: Jon J. Nordby, Ph.D., D-ABMDI, Consultant in Forensic Science & Forensic Medicine

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Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

68-50

CONFIDENTIAL

Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

Dr. Kent B. Remley, MD
Professor of Radiology and Otolaryngology; Dept. of Radiology, Neuroradiology Section
University of Minnesota School of Medicine, Box 292
420 Delaware Street, SE
Minneapolis MN 55455

COPY COVER

RE: Request for further assistance from your department faculty colleagues cited by Dr. David Sabow

(cover for attached — 6 copies sent)

DATE: October 1, 2004

As I stated, I have been asked to review the previous investigations into Col. James E. Sabow's death, focusing upon the scientific and medical evidence. Dr. David Sabow, the decedent's brother, referenced six (6) additional faculty colleagues who supported the opinion that ***the scientific and medical evidence proves conclusively that Col. Sabow died at the hand of another as the result of a homicide.***

Unfortunately, I do not have their names, nor do I have access to their specific opinions. Therefore I request your help in obtaining all the pertinent data from your six colleagues, together with their specific opinions and their scientific foundations.

I deeply appreciate your immediate help with this effort. I want to assure you and your fellow faculty that ***all the relevant data and all the associated opinions and conclusions drawn from that data*** will be openly received with the objectivity and dispassion customary in the natural sciences. This information is vital to my independent investigation through Assistant Defense Secretary Charles Abell on behalf of the House Armed Services Committee.

As previously stated, any additional comments are most appreciated. I have enclosed six (6) copies of my original letter for distribution to the six faculty members who participated with in this analysis for Dr. David Sabow. Again, thank you so much for your timely assistance.

Respectfully,

Jon

Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

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University Place, WA 98466-1426

CONFIDENTIAL 68-51

Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

TO: Six Faculty members concurring with Dr. Kent B. Remley, MD
Professor of Radiology and Otolaryngology
Dept. of Radiology, Neuroradiology Section
University of Minnesota School of Medicine
Box 292
420 Delaware Street, SE
Minneapolis MN 55455

COPY 6 LETTERS to FACULTY

[6 copies – one for each of the other professors – sorry, I was not given your names]

FROM: Jon J. Nordby, Ph.D., D-ABMDI, Consultant in Forensic Science & Forensic Medicine

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Jon

Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

68-53

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Base Rate: 1.06
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Sent To: DR. KENT DEIMLEY Box 242
Street, Apt. No.; or PO Box No. 420 DELAWARE ST SE
City, State, ZIP+4 MINNEAPOLIS MN 55455

PS Form 3800, June 2002 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

DR. DAVID RUBINSTEIN
U. OF COLORADO HOSPITAL
CAMPUS BOX A-034
4200 E NINTH AVE
DENVER CO 80262

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) [illegible] C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

OCT

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from ser 7003 2260 0002 8089 5990

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-154

DER: COMPLETE THIS SECTION

mplete items 1, 2, and 3. Also complete
n 4 if Restricted Delivery is desired.
t your name and address on the reverse
that we can return the card to you.
ach this card to the back of the mailpiece,
on the front if space permits.

le Addressed to:

TONIO VERDUCCI
14 SICARD SE
ASHINGTON DC 20376

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☑ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

U.S. NAVY ANACOSTIA ANNEX OCT 12 2004

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

e Number (fer from service label) 7003 2260 0002 8089 5969

n 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

JACK L FELDMAN
U OF CALIF, LOS ANGELES
405 HILGARD AVE
LOS ANGELES CA
90024-1527

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☑ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery 10 4 04

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7003 2260 0002 8089 5983

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-154

7003 2260 0002 8089 5990

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DENVER CO 80262

Postage	$ 0.37
Certified Fee	2.30
Return Receipt Fee (Endorsement Required)	1.75
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 4.42

UNIT ID: 0056

UNIVERSITY STA TACOMA WA
Postmark Here
OCT - 1 2004
Clerk: KT6NHQ
10/01/04
USPS 034665

Sent To: DR DAVID RUBINSTEIN
Street, Apt. No.; or PO Box No.: U. OF COLORADO HOSP. BOX A:034
City, State, ZIP+4: 4200 E NINTH AVE DENVER CO

PS Form 3800, June 2002 — See Reverse for Instructions

7003 2260 0002 8089 5969

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OFFICIAL USE

WASHINGTON NAVY YARD, DC 20376

Postage	$ 0.37
Certified Fee	2.30
Return Receipt Fee (Endorsement Required)	1.75
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 0.63

UNIT ID: 0056

UNIVERSITY PLACE WA
Postmark Here
OCT - 1 2004
Clerk: KT6NHQ
10/01/04 98466

68-55

Sent To: ANTONIO VERDUCCI
Street, Apt. No.; or PO Box No.: 614 SICARD SE
City, State, ZIP+4: WASHINGTON DC 20376

PS Form 3800, June 2002 — See Reverse for Instructions

7003 2260 0002 8089 5952

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OFFICIAL USE

HAWTHORNE, FL 32640

Postage	$ 0.37
Certified Fee	2.30
Return Receipt Fee (Endorsement Required)	1.75
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 4.42

UNIT ID: 0056

UNIVERSITY PLACE WA
Postmark Here
OCT - 1 2004
Clerk: KT6NHQ
10/01/04 98466

Sent To: DR. MARTIN FACKLER
Street, Apt. No.; or PO Box No.: RR 4 BOX 264
City, State, ZIP+4: HAWTHORNE FL 32640

PS Form 3800, June 2002 — See Reverse for Instructions

7003 2260 0002 8089 5983

U.S. Postal Service™
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For delivery information visit our website at www.usps.com®

OFFICIAL USE

LOS ANGELES, CA 90024

Postage	$ 0.37
Certified Fee	2.30
Return Receipt Fee (Endorsement Required)	1.75
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 4.42

UNIT ID: 0056

UNIVERSITY PLACE WA
Postmark Here
OCT - 1 2004
Clerk: KT6NHQ
10/01/04 98466

Sent To: JACK L FELDMAN
Street, Apt. No.; or PO Box No.: 405 HILGARD AVE
City, State, ZIP+4: LOS ANGELES CA 90024-1527

PS Form 3800, June 2002 — See Reverse for Instructions

Instructions

Customs Declaration CN 22 — Sender's Declaration

I, the undersigned, whose name and address are given on the item, certify that the particulars given in this declaration are correct and that this item does not contain any dangerous article or articles prohibited by legislation or by postal or customs regulations. This copy will be retained at the post office for 30 days.

Sender's Name & Address

JON NORDBY
3532 SOUNDVIEW DR W
UNIVERSITY PLACE WA 98466

Addressee's Name & Address

MR. ANTONIO VERDUCCI
CIVILIAN HUMAN RESOURCES
WASHINGTON NAVY YARD
614 SICARD SE WASHINGTON DC 20376

Date and sender's signature

10-1-04

68-56

finalanalysis

From: Jack L. Feldman [feldman@ucla.edu]
Sent: Tuesday, October 05, 2004 1:58 PM
To: finalanalysis@comcast.net
Subject: Response to Certified Letter

Dear Dr. Nordby,

I am in receipt of your certified letter dated 29 September 2004. My present schedule is exceptionally busy, and I cannot possibly respond to your request for information before 1 November 2004. Moreover, I may no longer have any information or files relevant to my analysis of the scientific and medical evidence in the death of Colonel James E. Sabow. I estimate that if I had all of the relevant information in hand, I would need several days to properly respond to the questions detailed in your letter.

My fee for consultation is $375/hour, $3500/day. Fees for testimony or travel will need to be negotiated.

Please let me know how you would like to proceed.

The address you used to contact me in your letter is not current. My current address is listed below.

Respectfully,

Jack L. Feldman, Ph.D. *Professor* | feldman@ucla.edu | P. 310 825 0954 | F. 310 825 2224
Department of Neurobiology, UCLA | Box 951763 | Los Angeles, CA 90095-1763

68-57

finalanalysis

From: finalanalysis [finalanalysis@comcast.net]
Sent: Thursday, October 07, 2004 1:09 PM
To: 'Jack L. Feldman'
Subject: RE: Response to Certified Letter
Importance: High

Dear Dr. Feldman,

Thank you very kindly for your prompt reply to my inquiry, and for the corrected contact information. Perhaps I labored under some further misunderstandings. Dr. David Sabow stated that you had previously reviewed the relevant medical data, and that you had already formulated your scientific opinion that Col. Sabow died as a result of homicidal violence. My request was, therefore, a request simply to provide me with that previously reached opinion(s). Its aim was also to discover leads on any relevant supporting scientific data which I might pursue independently in my own work on Col. Sabow's death. If you have not reached such an opinion(s) about Col. Sabow's death, and you do not have access to any such data, then that information is also important for me to know. If you offered Dr. Sabow a preliminary opinion, dependent upon the receipt of additional data not yet forthcoming, then it would help me to understand that as well.

I do appreciate the hectic nature of your schedule, your need for sufficient time, and the need for adequate compensation for undertaking such work. I mistakenly (?) thought that my request was directed toward work that you had previously done rather than toward work yet to be scheduled, or work dependent upon the receipt of some new data. I am happy to compensate you at your rate of $375/hr or $3500/day for your response to these perhaps more historical questions, and for any assistance that you might provide to me in clarifying Dr. Sabow's rather strong statements to the effect that your work on this case proves that Col. Sabow could not possibly have committed suicide.

Thank you so much for your time. I would be happy to arrange a telephone call at your convenience, or simply to exchange emails. I am also happy to compensate you for your time and trouble in dealing with this matter so vital to the Sabow family and to everyone concerned. If you could simply return an email with a date and a time that I might telephone you, perhaps that would be sufficient. I await hearing from you.

Respectfully,
Jon
Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

-----Original Message-----
From: Jack L. Feldman [mailto:feldman@ucla.edu]
Sent: Tuesday, October 05, 2004 1:58 PM
To: finalanalysis@comcast.net
Subject: Response to Certified Letter

Dear Dr. Nordby,

68-58

I am in receipt of your certified letter dated 29 September 2004. My present schedule is exceptionally busy, and I cannot possibly respond to your request for information before 1 November 2004. Moreover, I may no longer have any information or files relevant to my analysis of the scientific and medical evidence in the death of Colonel James E. Sabow. I estimate that if I had all of the relevant information in hand, I would need several days to properly respond to the questions detailed in your letter.

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Respectfully,

Jack L. Feldman, Ph.D. *Professor* | feldman@ucla.edu | P. 310 825 0954 | F. 310 825 2224
Department of Neurobiology, UCLA | Box 951763 | Los Angeles, CA 90095-1763

68-59

finalanalysis

From: Jack L. Feldman [feldman@ucla.edu]
Sent: Thursday, October 07, 2004 1:29 PM
To: finalanalysis
Subject: Re: Response to Certified Letter
Importance: High

Dear Jon,

I prepared a letter for Dr. Sabow in 1994 based on an analysis of material he gave me, which included an autopsy report. I presume you have a copy of this letter. If not, since it was prepared for Dr. Sabow, I suggest you contact him for a copy, or a notarized letter from him giving me permission to release the letter to you. In the letter, I reviewed data relevant to the issue of the presence of significant amount of "aspirated" blood in Col. Sabow's lung, and gave my opinion as to the likelihood of any of several scenarios for the death of Col Sabow.

Sincerely,

Jack

Jack L. Feldman, Ph.D. *Professor* | feldman@ucla.edu | P. 310 825 0954 | F. 310 825 2224
Department of Neurobiology, UCLA | Box 951763 | Los Angeles, CA 90095-1763

On 10/7/04 1:08 PM, "finalanalysis" <finalanalysis@comcast.net> wrote:[

> Dear Dr. Feldman,
>
> Thank you very kindly for your prompt reply to my inquiry, and for the corrected contact information. Perhaps I labored under some further misunderstandings. Dr. David Sabow stated that you had previously reviewed the relevant medical data, and that you had already formulated your scientific opinion that Col. Sabow died as a result of homicidal violence. My request was, therefore, a request simply to provide me with that previously reached opinion(s). Its aim was also to discover leads on any relevant supporting scientific data which I might pursue independently in my own work on Col. Sabow's death. If you have not reached such an opinion(s) about Col. Sabow's death, and you do not have access to any such data, then that information is also important for me to know. If you offered Dr. Sabow a preliminary opinion, dependent upon the receipt of additional data not yet forthcoming, then it would help me to understand that as well.
>
> I do appreciate the hectic nature of your schedule, your need for sufficient time, and the need for adequate compensation for undertaking such work. I mistakenly (?) thought that my request was directed toward work that you had previously done rather than toward work yet to be scheduled, or work dependent upon the receipt of some new data. I am happy to compensate you at your rate of $375/hr or

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Respectfully,
Jon
Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

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From: Jack L. Feldman [mailto:feldman@ucla.edu]
Sent: Tuesday, October 05, 2004 1:58 PM
To: finalanalysis@comcast.net
Subject: Response to Certified Letter

Dear Dr. Nordby,

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Please let me know how you would like to proceed.

The address you used to contact me in your letter is not current. My current address is listed below.

Respectfully,

Jack L. Feldman, Ph.D. *Professor* | feldman@ucla.edu | P. 310 825 0954 | F. 310 825 2224
Department of Neurobiology, UCLA | Box 951763 | Los Angeles, CA 90095-1763

68-61

finalanalysis

From: finalanalysis [finalanalysis@comcast.net]
Sent: Friday, October 08, 2004 12:15 PM
To: 'Jack L. Feldman'
Subject: RE: Jack Feldman, Ph.D., Response to Certified Letter
Importance: High

ANSWERED OCT 0 8 2004

Dear Jack,

Thanks so much for your timely reply and for your information concerning the presence of significant amounts of "aspirated" blood in Col. Sabow's lung. I do have a copy of your thoughtful 1994 letter, which you prepared for Dr. Sabow. It was presented to me as part of a larger report on Col. Sabow's death prepared by Dr. Sabow himself.

One follow up question – do you recall what materials he provided to you for your analysis, besides the original autopsy report? You state in your letter that you reviewed the autopsy report and "other information concerning the death of Col. Sabow." [I do have access to ***what has been represented to me as all the medical data***, including all the x-rays, all the autopsy photographs, all the scene photographs, the single scene video, and all the original scene sketches, notes, and laboratory reports as well as the autopsy report]. When offering your alternative scenarios, it would be very helpful to me to know what data was made available to you as this "other information." Of course if there is data beyond what I have listed here, or beyond ***what has been reported to me as all the medical data***, then I am both anxious and obligated to recover it for my own independent analysis.

My obvious concern is to recover and include ***all relevant available scientific and medical evidence*** concerning Col. Sabow's death.

I would also appreciate knowing if anyone besides Dr. Sabow, other than me, has contacted your regarding your 1994 letter to Dr. Sabow, or its contents.

Again, I wish to express my deep appreciation for your helpful contributions to these efforts. As you so astutely state, many explanations can be consistent with certain sets or even sub-sets of available evidence – but I have been charged to seek and recover, as closely and completely as possible, the totality of that scientific and medical evidence in this case. Your help is both urgently needed and deeply appreciated.

A quick email would be more than sufficient. Again, thanks so much for your valuable time.

Respectfully,

Jon

Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

-----Original Message-----
From: Jack L. Feldman [mailto:feldman@ucla.edu]

68-62

Sent: Thursday, October 07, 2004 1:29 PM
To: finalanalysis
Subject: Re: Response to Certified Letter
Importance: High

Dear Jon,

I prepared a letter for Dr. Sabow in 1994 based on an analysis of material he gave me, which included an autopsy report. I presume you have a copy of this letter. If not, since it was prepared for Dr. Sabow, I suggest you contact him for a copy, or a notarized letter from him giving me permission to release the letter to you. In the letter, I reviewed data relevant to the issue of the presence of significant amount of "aspirated" blood in Col. Sabow's lung, and gave my opinion as to the likelihood of any of several scenarios for the death of Col Sabow.

Sincerely,

Jack

Jack L. Feldman, Ph.D. *Professor* | feldman@ucla.edu | P. 310 825 0954 | F. 310 825 2224
Department of Neurobiology, UCLA | Box 951763 | Los Angeles, CA 90095-1763

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I do appreciate the hectic nature of your schedule, your need for sufficient time, and the need for adequate compensation for undertaking such work. I mistakenly (?) thought that my request was directed toward work that you had previously done rather than toward work yet to be scheduled, or work dependent upon the receipt of some new data. I am happy to compensate you at your rate of $375/hr or $3500/day for your response to these perhaps more historical questions, and for any assistance that you might provide to me in clarifying Dr. Sabow's rather strong statements to the effect that your work on this case proves that Col. Sabow could not possibly have committed suicide.

68-63

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Respectfully,
Jon
Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

-----Original Message-----
From: Jack L. Feldman [mailto:feldman@ucla.edu]
Sent: Tuesday, October 05, 2004 1:58 PM
To: finalanalysis@comcast.net
Subject: Response to Certified Letter

Dear Dr. Nordby,

I am in receipt of your certified letter dated 29 September 2004. My present schedule is exceptionally busy, and I cannot possibly respond to your request for information before 1 November 2004. Moreover, I may no onger have any information or files relevant to my analysis of the scientific and medical evidence in the death of Colonel James E. Sabow. I estimate that if I had all of the relevant information in hand, I would need several days to properly respond to the questions detailed in your letter.

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Please let me know how you would like to proceed.

The address you used to contact me in your letter is not current. My current address is listed below.

Respectfully,

Jack L. Feldman, Ph.D. *Professor* | feldman@ucla.edu | P. 310 825 0954 | F. 310 825 2224
Department of Neurobiology, UCLA | Box 951763 | Los Angeles, CA 90095-1763

68-64

Anthony John Verducci
Lieutenant Colonel, U.S. Marine Corps (Ret.)
3503 Madelyn Court
Woodbridge, Virginia 22192

October 21, 2004

Sent by facsimile to (253) 627-0350
Jon J. Nordby, Ph.D.
3532 Soundview Drive West
University Place, WA 98466-1426

Dear Dr. Nordby:

I am responding to your letter of September 29, 2004 requesting responses to five specific questions associated with your review of matters stemming from the tragic death of Colonel James E. Sabow, U.S. Marine Corps.

In addition to my responses, I am providing a bit of background information that may help you more fully understand my role in the death investigation. Please understand that I have no medical or scientific training in the fields of anatomy or forensic pathology. I was awarded my juris doctor (law) degree from the Seton Hall University School of Law in June 1990 and completed the Naval Justice School training course for new judge advocates in October 1990 before reporting aboard Marine Corps Air Station (MCAS) El Toro in about November 1990. I was in charge of the Legal Assistance Branch of the MCAS Joint Law Center in January 1991 at the time Colonel Sabow died. Within a day or so of Colonel Sabow's death, Colonel William Lucas, Staff Judge Advocate, ordered me to assist Mrs. Sally Sabow with the myriad of legal issues that are typically associated with the death of an active duty service member.

A few days after I met Mrs. Sabow and reported our meeting to Colonel Lucas, he informed me that I was assigned to conduct the administrative investigation required by the Judge Advocate General's Manual (JAGMAN investigation). JAGMAN investigations are required in a host of circumstances, including the death of a service member. Colonel Lucas instructed me to comply with the JAGMAN requirements and cautioned me from bothering Mrs. Sabow or delving into the facts and circumstances of an Inspector General (IG) investigation that was underway at the time of Colonel Sabow's death.

With regard to your questions:

1. I do not feel qualified to express a scientific and medical opinion about the manner of Colonel Sabow's death. I did not have access to the Naval Investigative Service (NIS), now Naval Criminal Investigative Service (NCIS), report at the time I authored my JAGMAN investigation. I opined in the JAGMAN investigation that it appeared as though Colonel Sabow died of a self-

inflicted gunshot wound. I wrote the report without discussing the facts and circumstances surrounding the death with Colonel Sabow's brother, Dr. David Sabow. Given the limited information available to me in February 1991, I am comfortable that my conclusion, at that time, was quite sound.

2. I have not gathered or analyzed any evidence or data in this matter. Although I have read a number of reports and pieces of correspondence regarding Colonel Sabow's death, I can only comment on the persuasiveness of the materials, not the basis upon which they are founded. To that end, the reports and materials that Dr. Sabow asked me to review raised my suspicions, as a layperson, about the nature of Colonel Sabow's death.

3. Again, I do not have the training required to render a scientific and medical opinion in this matter. Although it is difficult to judge the persuasiveness of any written argument; after reading the materials Dr. Sabow provided I was no longer sure that Colonel Sabow's death was a suicide. Again, my belief was based on materials provided, no independent review of evidence or data.

4. Dr. Sabow erred if he indicated that I analyzed material and provided a scientific and medical opinion in this matter. I wrote a letter, at Dr. Sabow's request, to support his effort to have a neutral, qualified party review the evidence and data in this matter. I regret if my statements calling for a new investigation led anyone to believe that I analyzed evidence and reached a scientific and medical conclusion that Colonel Sabow had been murdered. Much of my personal opinion and conjecture was based upon representations made by Dr. Sabow and his investigator, Gene Wheaton. I placed great weight on what these men told me because I considered them experts in their respective fields of neurology and criminal investigations.

5. I have not been subjected to any pressure to develop, change, or modify my opinion about Colonel Sabow's death. In addition to speaking with Dr. Sabow and Mr. Wheaton on a number of occasions, I have read many pieces of correspondence that Dr. Sabow provided since I authored my JAGMAN investigation. Department of the Navy officials have not pressured me, in any way, to develop, change, or modify my opinions in this matter.

Colonel Sabow's death was a great tragedy. I am quite comfortable that the opinions I expressed in my JAGMAN investigation were well supported by the evidence available at that time. The additional evidence Dr. Sabow provided over more than the next decade led to me believe that Colonel Sabow's death may not have been suicide. My present opinion is that medical and forensic professionals reviewing the evidence have ample material to support either conclusion: homicide or suicide. I believe that, in court, this matter would come down to a "battle of the experts." People are apt to believe the statements and arguments presented by the side they find more credible.

I have the utmost respect for Dr. Sabow and the steadfast manner in which he has pursued this matter. I regret that I lack the professional expertise to shed any meaningful light into this matter. Please feel free to call me if you require additional information. I can be reached at (202) 685-6412 from about 7:00 AM until 3:30 PM each workday.

Sincerely,

Anthony John Verducci

68-67

Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

October 22, 2004

Mr. Antonio Verducci
Civilian Human Resources
Washington Navy Yard
614 Sicard, SE
Washington DC 20376

COPY

COMPLETED OCT 2 2 2004

Dear Mr. Verducci,

Thank you for your thoughtful reply to my September inquiry regarding my independent investigation of Col. James E. Sabow's tragic death. I appreciate your prompt response. I regret that our busy schedules prevented us from connecting on the telephone but your letter's thoroughness answered my questions. If other questions arise in the future, I very much appreciate your offer to help.

I have spent most of my professional life assisting law enforcement, the courts, families, and individual family members to explain an individual's equivocal death from relevant applications of the forensic sciences & forensic medicine to case facts. I hope to do so in this case; but I can do so only when I have access to all the case facts. Of course that requires cooperation from all concerned. Again, thank you for your kind assistance.

Appreciatively,

Jon

Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

Jon J. Nordby, Ph.D., D-ABMDI & Associates
Phone: (253) 627-2739 *Street address:* *Email: finalanalysis@comcast.net*
FAX: (253) 627-0350 *3532 Soundview Drive West* *Website: www.finalanalysisforensics.com*
University Place, WA 98466-1426

University of Colorado Health Sciences Center

68-68

Department of Radiology
School of Medicine
4200 East Ninth Avenue, A034
Denver, Colorado 80262

October 20, 2004

Jon J Nordby, Ph.D., D-ABMDI, Consultant
Jon J Nordby, Ph.D., D-ABMDI and Associates
3532 Soundview Drive West
University Place, WA 98466-1426

Dear Dr. Nordby:

I apologize the delay in my response as I was on vacation.

I am responding to your letter regarding the death of Colonel James E. Sabow. I have little recollection of the work that I did on the case and do not have any records regarding the case. My memory is that I reviewed radiological images provided by Colonel Sabow's brother and rendered an opinion. I gave that opinion to Dr. Sabow. I am not sure that I can be of any further help.

Sincerely,

David Rubinstein, M.D.
Associate Professor, Radiology and Neurology

68-69

ORANGE COUNTY SHERIFF – CORONER DEPARTMENT

FAX COVER SHEET

TO: Dr. John Nordby PHONE: 253 627-2739 FAX: 253 527-0350

ORGANIZATION: Dr. John Nordby's Office

FROM: CORONER Le'Lonnie PHONE: (714) 647-7400 FAX: (714) 647-6122

DATE: 10/25/2004 NUMBER OF PAGES (+COVER) 1

CORONER CASE/NAME: 91-000474-SU Sabow, James Emory

CLASSIFICATION OF DEATH: Suicide

ITEM(S) FAXED: TOX ___ MICRO___ VOD___ NEURO ____

NEUROMICRO___ CI ___ SUMMARY _____

NOTES: _____

WARNING/CONFIDENTIAL

This facsimile transmission constitutes a confidential communication intended **only** for the addressee indicated above. Please notify us as soon as possible at the telephone number shown above of any error in transmission. Thank you for your cooperation.

68-70

SHERIFF-CORONER DEPARTMENT
COUNTY OF ORANGE
CALIFORNIA

MICHAEL S. CARONA
SHERIFF-CORONER

1071 W. SANTA ANA BOULEVARD
SANTA ANA, CA 92703
(714) 647-7400

ASSISTANT SHERIFFS
JO ANN GALISKY
PETE GANNON
DON HAIDL
KIM MARKUSON
DOUG STORM

October 25, 2004

Re: Coroner case #91-00474-SU
Sabow, James Emory

Attn: Dr. John Nordby

Dear Dr. Nordby,

In response to your verbal request on 10/25/04, for any spinal cord fluid, lung histology and brain histology (medulla) on the aforementioned coroner case, I checked in our log and found tox was discarded on 07/28/1991, wet tissue was discarded on 07/17/2000 and pm blood was discarded on 07/14/2003.

If you have any further questions or requests, please call me at 714 647-7400 ext 2.

Sincerely,

Le'Lonnie Sylvester
Office Supervisor
OC Coroner Division

68-71

COPY

finalanalysis

From: Awtrey, John F., CIV, DHRA [Awtreyjohn@osd.pentagon.mil]
Sent: Friday, October 22, 2004 7:31 AM
To: 'finalanalysis'
Subject: RE: Sabow Investigation Update: November 8, 2004

Jon,
Several things:
- Contract is extended to November 8, 2004
- I'm making arrangements for the Navy Criminal Investigate Service (NCIS) Field Office in Seattle to recover the weapon from you, once you're through with it/the contract ends. More when the details are worked out.
- On travel -- If you need to go to San Diego, it's best if you make your on airline/lodging reservations. You know schedule best, in the closest real time. Here it would take four govt offices, with the attendant ream of paper to do this simple task. You'll be reimbursed according to the Joint Travel Regulation for transportation costs (coach) and per diem for the trip.
- We've got to note the new property (the shotgun) that DoD will acquire through this contract in the records - so if you could send me the make and model of the gun you are going to use, I'd appreciate t.
Thanks,
Johr

John F. Awtrey
Director,
Law Enforcement Policy and Support
OUSD(P&R)PI
4040 N. Fairfax Dr. Suite 200
Arlington, VA 22203

☎ Voice: (703) 696-0846
FAX: (703) 588-1375
E-Mail: john.awtrey@osd.pentagon.mil

-----Original Message-----
From: finalanalysis [mailto:finalanalysis@comcast.net]
Sent: Friday, October 22, 2004 2:02 AM
To: Awtrey, John F., DHRA
Subject: Sabow Investigation Update: November 8, 2004
Importance: High

Dear John -

Just time for an extended note - despite the following details, my independent data collection and case report review & analysis is mostly complete - with revisions from our recent telephone conversation in mind, I researched the weapon further - long story so - a short version: measurements were done incorrectly by original investigators [e.g. the weapon is NOT 34 ¾ " long]; other properties were apparently either incorrectly noted, taken at someone's word without checking, or missed entirely etc.: So the data given in reports is not consistent with known Ithaca weapons of either the pre-1925 era [Damascus barrels] or those from up to 1948 [serial number is too low for these models]; it doesn't work with the post 1975 to 1985 era of SKB Japanese reproductions using drawn steel, etc. either; all this is confirmed by two weapon historians, a weapon collector and also the Ithaca Gun Company's chief gun smith & historian with whom I spoke tocay - the given serial number is no help in either direction although "R" as a prefix in one NCIS notation as repeated in one other report suggests "reproduction" as a possible interpretation. but no one is sure - that's just a guess.

Further, the original crime scene investigators, or other scientific investigators along the way, failed to note any of the weapon's properties pertaining to each barrel [No choke? Full? Improved cylinder? Modified? or what?] and they failed to document the weapon in any photos made available to me, except as it is seen in

68-72

the crime scene video - and no one appears to have examined the weapon INSIDE the barrels either, or if they did look beyond the 1 ½ or so of a given a choke tube, they failed to write down any of their observations - and of course no photos were taken of that staining described around the muzzle either - no overalls of the weapon, no stains, etc., and no inside the barrel photos. No photos of fingerprint latent attempts either - zero, or just nothing identifiable? Now I hear that CRC Press has the second edition of great forensic science text book available soon to help solve training problems like these - it's by two guys named James and Nordby . . . every office needs a couple copies!

I always try to assume the best about individuals who make these unfortunate investigative efforts: I assume that *they assumed* they had the weapon itself if they needed it for further analysis. Of course we know that works only if the evidence remains preserved in a given case, and if the case never raises further questions. And it's always bad in this business to assume anything. Given Dr. Sabow's refusal - twice orally and once by ignoring my written request - to release the weapon to me for my analyses, I guess you know where that leaves me. And even if I did receive the weapon for my proposed testing, any trace evidence would be significant only if still present - its absence would be meaningless given chain of custody issues. So sins of commission and omission always come back.

After - . . . another long story . . . - I finally determined the properties of the weapon's side-by-side barrel, and tonight secured a shotgun which to the best of my belief and to the best application of my investigative efforts has characteristics identical to the weapon at issue. If there is a slight difference, it is only slight and irrelevant at the muzzle to target range [contact/close contact] involved in this case. I think I can clarify many questions through this work.

A note on budget: the only other options for a weapon would have cost an additional $1000 to $1500 (in antique value only I believe and am told) and taken at least 3 to 4 more weeks for delivery and transfer. And neither could *safely* shoot the contemporary smokeless powder shell reportedly involved in Col. Sabow's fatal wound since the barrels were designed for black powder paper shot shells of the so-called 'cowboy era.' The weapon I purchased will be available for testing on Monday October 25, 2004 and will do all that we need it to do. I plan to work all weekend 24 hours a day if need be with my lab assistant - who is not happy at the prospect - preparing ballistics gel, the targets, tests, and experiments which I deem relevant, and as I said, I will need two additional weeks from that date to complete my work and issue my report. I may have to re-think my lab rate for long days after this case is completed! [Please note that I will not bill for all the unproductive time spent hunting the weapon, nor for the many clock-hours spent by my two assistants doing the same thing - just for your information, anyway].

So I need until November 8, 2004. I pray that we can all survive the change from Oct. 31 and that the powers will understand the reasons - my current health being the primary but not the sole problem as you know.

Also during this next week I must either travel to Orange County California to examine certain physical specimens reportedly preserved from Col. Sabow's autopsy, or arrange to have them sent to my lab here for my examination, at their office's discretion and according to their protocols, of course. I will attempt to contact the Orange County Coroner/ME's office tomorrow Friday October 22, 2004 to try to arrange for that examination. Given my current health, I would prefer that they send the items to me for analysis here in my lab; however, I am prepared to travel to Orange county if I must in the next week. I think it is *that* important for clarifications needed to complete my work on this case.

If I must fly to their office, I need your office or Secretary Abell's office to arrange both for my flights and an overnight stay [a stay only if necessary - I'd rather do the turn around]. We should remain within the modified budget. If I can finish the work and the report any earlier than November 8, I will certainly give it my very best shot, pun intended. Will that be problem? And speaking of lawyers . . . ?

I really look forward to completing work on this case, if that is ever to be possible in a practical sense,--- and to providing you, the Secretary, and the Committee with a solid piece of scientific work to help address concerns voiced over the years since 1991. Hope you spent a rewarding law enforcement conference.

Respectfully, and with my best wishes and thanks for your patient help and kind support,

68-73

Jon

Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics

PS
Please let me know your thinking about this extension and the possible travel as soon as you have the time

68-74

finalanalysis

From: Awtrey, John F., CIV, DHRA [Awtreyjohn@osd.pentagon.mil]
Sent: Wednesday, October 20, 2004 6:09 AM
To: 'finalanalysis'
Subject: RE: Sabow Investigation & Funding

Jon,
Two items. First - the funding package has been signed/approved and money is being transferred to the contracting office, to cover the additions you sent me + the items in your message below. Second - on liability, my lawyers advise me that the Code of Federal Regulations on the provision of private counsel by the Federal Govt basically, only covers federal employees, not individuals under contract to the government. However, there may be a couple of excepticns to the general rule and they are looking now. Will let you know as soon as I find out.
John

-----Original Message-----
From: finalanalysis [mailto:finalanalysis@comcast.net]
Sent: Saturday, October 16, 2004 5:47 PM
To: Awtrey, John F., DHRA
Subject: Sabow Investigation & Funding
Importance: High

Dear John,

In the fax I sent regarding the need for additional funding, I forgot to include one significant item: the funding required to buy an Ithaca Model 200E 12 gauge side-by-side shotgun with 26" barrels. I will also need to make ballistics gelatin and skeletal "skull box models" for my testing. It is quite clear to me that few appreciate the significance of using, say, 12 gauge Dove & Quail rounds vs., say, the significance of using 12 gauge 00 - buck rounds! I do think that the demonstrable evidence will help disambiguate matters considerably: both with issues apparent through my own work and the obvious issues apparent in the case as a whole for those who get their ballistics from watching too much TV.

Making the skull boxes, gel, and setting up the range for shot shell ammunition I estimate will cost about $2000 to $3000 with the weapon itself and ammunition adding anywhere from $600 to $1800, depending upon availability and condition. I have done this type of testing before when questions have been raised about the weapon, ammunition, or both. Of course it would be ***preferable*** to use the original shotgun, but Dr. Sabow made ***it very clear*** that he sees no value in testing it, and that providing it would introduce undue hardship for the family. I will also need my lab assistant for a couple days to help with the video taping.

Many of the registered letters sent to Dr. Sabow's world-renowned experts have been returned to me unopened - my lab assistant spent one full day and most of the night running these folks down again via internet connections etc. Again, Dr. Sabow provided no help whatever in that regard. I what to find and consider every bit of physical evidence in order to avoid the charge made by Dr. Sabow about official investigations not doing any investigating, but "merely reading reports."

I have developed an infection in one of my incisions which is causing some problems. Other than that, along with the usual pain, I'm continuing to hold my own. Since time is critical, I will move on these items immediately.

Thanks so much for your invaluable assistance and support.

Best, Jor

Final Analysis Forensics

DATE: August 10, 2004
TO: Dr. David Sabow, MD, PO Box 5518, Rapid City SD 57709
FROM: Jon J. Nordby, Ph.D., D-ABMDI
Final Analysis Forensics
3532 Soundview Drive West
University Place WA 98466-1426
RE: Case #04-0514

Dear Dr. Sabow,

I understand from our conversations that you possess evidence relevant to my scientific investigation of your brother's tragic death. I request that you send this evidence to my laboratory in University Place Washington at the address below for scientific analysis. In particular, I would appreciate your cooperation in receiving the Ithaca side-by-side 12 gauge shot gun instrumental in your brother's death. If you still have any of the original Winchester Duck and Quail 12 gauge rounds, I would also appreciate the chance to examine them. Of course I will return all materials to you as soon as my analyses are complete. I hope to be finished by October 30, 2004, and you will have the material returned by that date.

You also mentioned a *PowerPoint* presentation of this evidence, which I would also appreciate the opportunity to review. I would also be happy to have you present this data to me in any form you might find convenient. As you know, I must consider all the available relevant scientific evidence in my reviews and analyses of this case in order to present the best scientific explanation of Col. Sabow's tragic death.

I want to assure you that I retain a dedicated passion for discovering and supporting the true explanation of your brother's death, whatever that may entail, popular or otherwise. My sole purpose is to present the best scientific and factual explanation allowed by this evidence. That may mean concluding that this evidence remains ambiguous and therefore supports no firm conclusion one way or the other. As you know, I remain steadfastly unmoved by external pressures of any sort regardless of source, whether real or perceived. I maintain an open, but not an empty mind.

Thank you so much for your help and cooperation in this matter. I look forward to receiving these materials at your earliest convenience and sharing my results with you when my report is completed.

Sincerely,

Jon J. Nordby, Ph.D., D-ABMDI
Consultant in Forensic Science & Forensic Medicine
Final Analysis Forensics
finalanalysis@msn.com
www.finalanalysisforensics.com

Laboratory/Offices 253-627-2739

Appendix IV

Curriculum Vitae

[Current to September 4, 2004]

Jon J. Nordby, Ph.D., D-ABMDI

Physical Address: *Final Analysis Forensics*
3532 Soundview Drive West
University Place, WA 98466

Email: Finalanalysis@msn.com **Web Page**: www.finalanalysisforensics.com

Phone: 253-627-2739 **Fax:** 253-627-0350 **Cell:** 253-691-2932

Present Positions: Consultant in forensic science and forensic medicine, *Final Analysis Forensics*; Medical Investigator & Forensic Specialist, National Disaster Medical System, DMORT, Region X, Federal Emergency Management Agency FEMA [formerly with the Department of Homeland Security]; Instructor, Washington State Criminal Justice Training Academy [Police – Patrol &Detective Training Facility]

Areas of Specialization: Forensic Science & Forensic Medicine, Medico-legal Death Investigation; Criminalistics; Bloodstain Pattern Analysis; Ballistics & GSR testing; Trace Evidence Analysis & Microscopy; Scientific Crime Scene & Event Reconstruction; Scientific Methodology; Logic, Ethics & Police Use-of-Deadly-Force Policy

Research

1. Publications Including Books

Sleuthing: Method Meets Murder, Jon J. Nordby. Ph.D. Pacific Lutheran University, Tacoma WA, 1st Edition, 1978

Sleuthing: Method Meets Murder, Jon J. Nordby, Ph.D., assisted by Karen Brandt, Forensic Science Associates, Tacoma WA, 2nd Edition, 1991

"How Approximations Take Us Away From Theory and Toward the Truth"
Pacific Philosophical Quarterly, July 1983

How the Laws of Physics Lie, written by Nancy Cartwright, with Cartwright & Nordby, co-authoring Essay #6, "For Phenomenological Laws," pp. 100-127; further acknowledgment of Nordby in Introduction, pp.1-20; Clarendon Press, Oxford University Press, New York, NY, 1983

Synthese: The Philosophy of Applied Science, Jon Nordby, Ph.D. & Vivian Weil, Editors, Vol. 81, Kluwer Academic Publishers, 1989

"Bootstrapping While Barefoot [Crime Models vs. Theoretical Models in the Hunt for Serial Killers]"
Synthese, Vol. 81, pp. 373-389, 1989

"Can We Believe What We See If We See What We Believe? Expert Disagreement"
Journal of Forensic Sciences, Vol. 37, No. 4, July 1992

"Can We Believe What We See If We See What We Believe? Expert Disagreement"

Reprinted, *The International Society of Air Safety Investigators Forum*, Vol. 26, No. 3, September, 1993

"Science is as Science Does: The Question of Reliable Methodologies in "Real Science," *Shepard's Expert and Scientific Evidence Quarterly*, Vol. 2, No. 3, winter 1995

"The Study of Philosophy Can Help Solve Mysteries," *Pacific Lutheran Scene Magazine*, fall, 1996

"A Member of the Roy Rogers Riders Club Must Follow the Rules Faithfully" *Journal of Forensic Sciences*, Vol. 42, No. 6, November, 1997

Dead Reckoning: The Art of Forensic Detection, CRC Press, 1999

Careers in the Forensic Sciences, Jon J. Nordby, Ph.D., contributor, Forensic Sciences Foundation, Colorado Springs, CO, 2000

"Is Forensic Taphonomy Scientific?" [Chapter in *Forensic Taphonomy: Volume II*, W. D. Haglund, Ph.D. & M. H.Sorg, Ph.D., Editors, CRC Press, 2002]

Forensic Science: An Introduction to Scientific and Investigative Techniques, Edited with Stuart James, and *chapters 1, 30, CRC Press, released August, 2002, copyright 2003*

Instructor's Guide for Forensic Science: An Introduction to Scientific and Investigative Techniques, Edited with Stuart James, Sara R. Kreisman, CRC *Press released September, 2002, copyright 2003*

2. Reviews

On the Trail of Murder; Inside Murder, a Psychiatric Portrait, by Walter Bromberg, MD Book Draft editorial review for MIT Press, 1995

Ethics in Forensic Science by Peter D. Barnett, Protocols in Forensic Science Series, CRC Press 2002, Book review for the *Journal of Forensic Sciences*, spring 2002

Associate Editor, *International Association of Bloodstain Pattern Analysts Review*, from 1993 – Reviewed many technical articles for publication to date

Guest Editor, *Journal of Forensic Sciences*, reviewer of articles on ethics, scientific method, Issues of bias and 'scientific neutrality'

3. Computer Programs

Della, *[Investigative reasoning training tool, teaching the logic of homicide investigation], Stanford University and Pacific Lutheran University, Aid Association for Lutherans, 1982-1983*

DOA, [*Death Occurrence Analyst*], reference and inference tool for the investigation of sudden, unexpected deaths, including homicides of each model type, with Clifford Jo, Copyright 1988

4. Radio and Television

Behind the Shield, "Homicide Investigation," with Mark Mann, Produced by Lane Ficke, Cable Channel 12, 1994

Cop Talk, "Dead Reckoning – Forensic Sciences & Law Enforcement," with Mark Mann, KVI 570 Seattle, Washington, 1995

Discovery Channel; Cronkite Ward Company, Documentary film – "Sherlock Holmes and the Hound of the Baskervilles," producer, Philippa Gilmore, Washington DC, 2002

5. Work in Progress

Encyclopedia of Forensic and Legal Medicine, Elsevier Science Ltd., "Crime Scene Management: US System," chapter, forthcoming reference book

Crime Scene Atlas, CRC Press, forthcoming book, 2008

6. Laboratory Research in Progress

Florescence Spectrometry in the Detection, Photography, and Analysis of Gun Shot Residues

7. Discussions of Dr. Nordby's work

Ramsland, Katherine, The *Forensic Science of C. S. I.*, published by Berkley Boulevard Penguin Putnam Inc., New York N.Y. 2001, chapter 6, especially pp. 128 – 132.

Discovery Channel; Cronkite Ward Company, Documentary film – "Sherlock Holmes and the Hound of the Baskervilles," producer, Philippa Gilmore, Washington DC, 2002

Grants and Fellowships

Aid Association for Lutherans, [awarded 1981-82] Regency Advancement Awards [two], NJI [not awarded], NSF [not awarded], PLU Presidential Grant, [$1000, 1986] Dr. Reike; Guy's Hospital Senior Research Fellowship [awarded 1994], other minor grants

Papers and Presentations

Date	Title	Status
1988	*Introducing Death Investigation to Legal and Human Services Professionals* PCME Workshop, Marriott Hotel Seattle Washington	Co-Organizer & Presenter [Student Evaluations]
1989	*Sleuthing Random Homicides* University of Portland Portland, Oregon	Invited lecture
1989	*Investigating a Mutilation Murder* St. Louis University School of Medicine St. Louis Missouri	Peer Review [prior review]
1990	*Forensic Applications of Logic & Probability Theory* American Academy of Forensic Sciences Cincinnati, Ohio	Peer Review [prior review]
1991	*Can We Believe What We See If We See What We Believe?* American Society of Forensic Odontology Anaheim, California	Invited by Peers [prior review]
1991	*Logic and Computer Science as Emerging Forensic Sciences*	Peer Review

American Academy of Forensic Sciences
Anaheim, California

1991 *Logical Problems in Knowledge Engineering: Criminal Investigative Analysis* — Invited by Peers
FBI Academy — [prior review]
Quantico, Virginia

1991 Murder Unrecognized — Invited by UW CME Officer
Highline Community Hospital
Riverton Campus, [Seattle]

1991 *The Perfect Murder* — Invited by Peers
Mystery Writers of Seattle — [prior review]
Seattle, Washington

1992 *Observation and the so-called 'Expert Witness'* — Invited by Peers
University of British Columbia Department of Forensic Pathology — [prior review]
Vancouver, British Columbia

1992 *Listen to the Silent Majority and Learn to Autopsy* — PLU Pr. Forum
Presidential Forum, Pacific Lutheran University — Invited
Tacoma, Washington

1993 *Taking the Mystery Out of Murder: Processing Indoor & Outdoor Crime Scenes* — PLU Women
Pacific Lutheran University — By invitation
Tacoma, Washington

1993 *Offering an Opinion of Your Opinion: What is Expert Opinion "Held to a Reasonable Degree of Medical or Scientific Certainty"?* — Peer Reviewed
American Academy of Forensic Sciences — [prior review]
Boston, Massachusetts

1994 *Extracting Signs From Scenes: Advanced Bloodstain Pattern Analysis* — Invited by Peers
University of British Columbia Dental School — [prior review]
Vancouver, British Columbia

1994 *The History and Philosophy of Forensic Science* — Invited by Peers
University of Washington Dept. of Clinical Medicine — [prior review]
Seattle, Washington

1994 *Science, Law, and the Quincy Myth* — Invited by Peers
Training Course for Corners and Forensic Pathologists — [prior review]
Office of the Chief Coroner Ministry of the Solicitor General
Toronto, Ontario Canada

1994 *Open Mind, Case Closed or Closed Mind, Case Open* — Invited by Peers
Training Course for Corners and Forensic Pathologists — [prior review]
Office of the Chief Coroner Ministry of the Solicitor General
Toronto, Ontario Canada

1994 *A Tabloid Explanation Meets Sherlock's Logic: Dousing Spontaneous Human Combustion* — Peer Reviewed
American Academy of Forensic Sciences
San Antonio, Texas

1994 *Forensic Science Education in the Year 2010* — Invited by Peers

American Academy of Forensic Sciences [prior review]
San Antonio, Texas

1995 *The Uses of Forensic Science* Organizer,
Multidisciplinary Symposium (now annually) [prior review]
American Academy of Forensic Sciences
Seattle, Washington

1995 *Forensic Scientific Evidence and Testimony in the Courtroom* Invited by Peers
Panelist, Scientific and Professional Standards Governing Forensic Science [prior review]
American Academy of Forensic Sciences
Seattle, Washington

1995 *Do Two Wrongs Make a Right?* Invited by Peers
Ethical Foundations of Forensic Psychiatry [prior review]
American Academy of Psychiatry and the Law
Seattle, Washington

1996 *Forced Change in Forensic Science* Peer Reviewed
AAFS Workshop
Nashville, Tennessee

1997 *Junk Science in the Courtroom* Invited by Peers
American Academy of Psychiatry and the Law [prior review]
New York, New York

1997 *Teamwork at the Crime Scene* Invited by Peers
Multidisciplinary Symposium [prior review]
American Academy of Forensic Sciences
New York, New York

1997 *Ethical Practice in the Forensic Sciences* Invited by Peers
Panelist, Plenary Session [prior review]
American Academy of Forensic Sciences
New York, New York

1998 *Ethics in Homicide Investigations* Invited lecture
Washington State Criminal Justice Training Commission
Seattle, Washington

1999 *Investigative Ethics for Sworn Law-enforcement Officers* Invited lecture
Washington State Criminal Justice Training Commission
Burien, Washington

2000 *Death Scenes & the Human Body* Invited lecture
UW Extension Lecture
Certificate Program in Forensic Science
Seattle Washington

2000 *Ethics in Homicide Investigations* Invited lecture
Washington State Criminal Justice Training Commission [prior review]
Basic Homicide Investigation
Seattle Washington

2000 *Doing Our Best While Doing Our Duty: The Ethics of Homicide Investigation* Invited by Peers
Police Executive Research Forum [PERF] Homicide Course [prior review]

Memphis, Tennessee

2000 *Klan Justice & the Liar's Paradox: New Evidence from Old Records* — Peer Reviewed
[Bias & Prejudice in the Investigation of Hate Crimes] — [prior review]
International Association of Bloodstain Pattern Analysts
Tucson, Arizona

2000 *Dead Reckoning: Cases and Principles of Investigation* — Invited by Peers
Oregon Health Sciences University
Portland, Oregon

2001 *Hate Crimes & Their Scientific Re-investigation* — Invited by Peers
Multidisciplinary Symposium on the Uses of Forensic Science — [prior review]
American Academy of Forensic Sciences
Seattle, Washington

2001 *Ethical Codes, Oaths of Honor and Police Use-of-Force* — Invited lecture
Washington State Attorney General's Office
Investigators Retreat
Ocean Shores, Washington

2001 Forensic Sciences: Death Investigation Course Spring Quarter
University of Washington Extension — Lecturer
Seattle, Washington

2002 Necessary Basics: Crime Scene Investigation and Event Reconstruction — Invited lecture
Washington Defenders Association
Investigators Conference
Ocean Shores, Washington

2002 Scientific Reasoning: Forensic Analysis and Inference to the Best Explanation — Lecturer
University of Washington Extension
Seattle, Washington

2003 *Ballistics & Crime Scene Reconstruction* — Invited lecture
Mystery Writers of Seattle
Seattle, Washington

Teaching Competencies

- Logic & Scientific Method; Philosophy of Science and Medicine; deductive logics, set theory, meta-mathematics, non-deductive logics; Ethics & Police Policy; Critical Thinking & Critical Intelligence Development

- Ballistics – Microscopy, Trajectory Analysis, GSR testing; Bloodstain Pattern Analysis: Crime Scene Reconstruction; Criminalistics; Medico-legal Death Investigation; Homicide Investigation; Identification & Recovery of Human Remains; Crime Scene Processing; Evidence Collection, Documentation and Analysis

Professional Memberships

Fellow, American Academy of Forensic Sciences
Diplomat, American Board of Medico legal Death Investigators
Association for Crime Scene Reconstruction
Canadian Society of Forensic Science
Founding Member, Department of Homeland Security
International Association of Bloodstain Pattern Analysts

International Criminal Justice Law Enforcement Expert Systems Association
(FBI, Home Office, Interpol, Metropolitan Police, Berlin Police, and U.S. Police Jurisdictions)
Pacific Northwest Forensic Science Study Group
Philosophy of Science Association
Scientific Working Group on Bloodstain Pattern Analysis [SWGSTAIN]
FBI [Federal Bureau of Investigation]
State Microscopical Society of Illinois

Professional Offices
American Academy of Forensic Sciences:
Charter Member, Council of Forensic Science Education
General Section Membership and Disciplines Committee
Program Chair, Multidisciplinary Session: The Uses of Forensic Science
Plenary Session Program Co-chair, Ethical Issues in Science & Law
Member, Ethics Task Force
General Section Program Co-chair, Scientific Sessions
Local Arrangements Committee, Seattle 1995; 2001
General Section Secretary
General Section Chair
General Section Director, 2002-
Member, Academy Board of Directors, 2002-
Member, Forensic Science Foundation Board of Directors, 2002-
Member, Academy Ethics Committee
International Criminal Justice Law Enforcement Expert Systems Association
Elected Chair, 1991
International Association of Bloodstain Pattern Analysts
Associate Editor, IABPA Technical Review Newsletter
SWGSTAIN [Scientific Working Group on Bloodstain Pattern Analysis] Legal Subcommittee,
Drafted Group's Ethics Code & Policy
FBI [Federal Bureau of Investigation], Washington DC

University Service
General Service:
Arête Society Member, term as President *[Phi Beta Kappa Chapter applicant]*;
Weight training coach for the PLU Football Team's offensive line, 1978-1981; Division II National Championship team; Player-coach, PLU Water Polo Club, 1978-1982;
General Advisor; Departmental Advisor; Philosophy Club Advisor; Committee Memberships: University Student Grievance Committee; Interim Committee; Interim Committee Chair; Non-Human Subjects Review Board; Human Subjects Review Board; Educational Policies Committee; Faculty Secretary; Department Chair; Administrative duties associated with chair; Supervising eight faculty and two support staff

Special Service:
Developed community /international service programs with law enforcement, legal community, and medical examiners offices in Washington State and London, England; By special invitation, lead the only group of U.S. students ever to visit the 'Black Museum' at Scotland Yard, London England; Presidential Forum: Death Investigation; Developed Student Internships with Pierce County Medical Examiner, and Tacoma Police Department.

University Employment History:
1. Entry rank 1977: Assistant Professor
2. Tenured academic year 1985 - 1986
3. Promoted to associate professor academic year 1988 - 1989
4. Promoted to full professor academic year 2000 - 2001
5. Retired as a full professor, became professor emeritus, academic year 2001 - 2002

Employment

Forensic Science & Forensic Medicine Consultant, *Final Analysis Forensics* (1984 -)
Medical Investigator & Forensic Specialist, National Disaster Medical System, DMORT Region X (1998-)
Founding Member, Department of Homeland Security
Instructor, Washington State Criminal Justice Training Commission (1995 -)
Professor Emeritus and Former Department Chair, Pacific Lutheran University
Consultant, B.C. Coroner's Service Forensic Unit (1988 – 1997)
Consultant, King County Medical Examiner's Office (1993 -)
Consultant, Pierce County Medical Examiner's Office (1992 -)
Consultant, Puyallup Police Department, Investigations Section (1995 -)
Formerly, Medical Investigator, training officer, King County Medical Examiner's Office (1992 – 1995)
Formerly, Medical Investigator, training officer, Pierce County Medical Examiner's Office (1986 – 1992)

Education

1970 BA St. Olaf College, Northfield, Minnesota, *Cum Laude*
1975 MA University of Massachusetts-Amherst
1977 Ph.D. University of Massachusetts-Amherst
1982 Visiting Scholar: Stanford University, Stanford California
1986 – 1991[inclusive; 6 years] Preceptorship, Forensic Pathology, E. Q. Lacsina, MD, Preceptor, PCMEO

Certification

Diplomat, American Board of Medico legal Death Investigators, Registry #412

National Disaster Medical System Deployments DMORT Region X

New York City – World Trade Center Terrorist Attack on America 9/11/01
Duties – Evidence Section – receive/examine/catalogue human remains & evidence for OCME & NYPD
Memorial Park - store, retrieve tissues for further forensic analysis
Imaging Section – computerize and review developing case files for OCME, NYPD, New York City Health Department, relevant Courts

Continuing Medical Education

1988 Death Investigation
U.W. School of Medicine
Seattle, Washington

1988 Death Investigation
U.B.C. Department of Pathology
Vancouver, British Columbia

1989 Death Investigation
Alberta Chief Medical Examiner
Calgary, Alberta

1989 Masters Three Death Investigation
St. Louis University School of Medicine
St. Louis, Missouri

1990 Guy's Hospital Medical School
Dept. of Forensic Medicine
London, England

1990 AAFS Continuing Medical Education
Recovery of Decomposed Remains
Cincinnati, Ohio

1992 Guy's Hospital
Department of Forensic Medicine
London, England

1992 Royal Society of Medicine
Police Surgeon & Forensic Medicine
London, England

1992 AAFS Continuing Medical Education
Forensic Radiology
New Orleans, Louisiana

1993 AAFS Continuing Medical Education
Assisted Suicide & the Law
Boston, Massachusetts

1994 Guy's Hospital Medical School
Dept. of Forensic Medicine

1994 AAFS Continuing Medical Education
Forensic Science & the Environment

London, England

1995 AAFS Continuing Medical Education
Scientific Evidence and Testimony
Seattle, Washington

1997 Mt. Sinai School of Medicine
Junk Science in the Courtroom
New York, New York

1999 DMORT Mass Disaster Training
US Department of Health &
Human Services
Gresham, Oregon

2001 AAFS Continuing Education
Scientific Sessions
Seattle Washington

2002 AAFS Continuing Education
Scientific Sessions
Atlanta, Georgia

2003 National Disaster Medical Service
National Conference
Reno, Nevada

2004 Pharmacology & Pharmacokinetics
Workshop #23
AAFS Dallas, Texas

San Antonio, Texas

1995 American Association Psychiatry & Law
Ethics in Medical Practice
Seattle, Washington

1997 AAFS Continuing Medical Education
Ethical Practice in Forensic Science
New York, New York

2000 DMORT Team #10 Training
US Department of Health &
Human Services
Edmonds, Washington

2001 Advanced Shooting Reconstruction
UNT Police Academy
Denton, Texas

2003 AAFS Continuing Education
Scientific Sessions
Chicago, Illinois

2003 Emergency Response to Terrorism
NDMS Conference
Reno, Nevada

Continuing Criminalistics Education

1989 University of Alberta
Forensic Archeology
Edmonton, Alberta

1990 New Scotland Yard
Hendon Police Training School
Scenes of Crime
London, England

1995 Oklahoma City PD & ME
ACSR & IABPA Training
Bombing Investigation
Oklahoma City, Oklahoma

1996 Forensic Science Study Group
Tacoma Police Department
Tacoma, Washington

1997 ACSR & IABPA Training
Ballistics; Bloodstains
Seattle, Washington

2000 IABPA Training
Bloodstain Pattern Interpretation

1990 New Scotland Yard
Fingerprints, 999
London, England

1991 Bureau of Criminal Apprehension
Bloodstain Pattern Analysis
Minneapolis, Minnesota

1996 AAFS Continuing Education
Scientific Sessions
Nashville, Tennessee

1997 AAFS Continuing Education
Scientific Sessions
New York, New York

1999 AAFS Continuing Education
Scientific Sessions
Orlando, Florida

2000 AAFS Continuing Education
Scientific Sessions

Tucson, Arizona

2002 AAFS Continuing Education
Fingerprint Technology
Stephen Meagher, FBI [Atlanta, Georgia]

2002 McCrone Research Institute
Hair & Fiber Microscopy
Chicago, Illinois

2003 State Microscopical Society of Illinois
Inter Micro Conference
Chicago, Illinois

2003 FBI Advanced Bloodstain Pattern Analysis
Scientific Working Group
Quantico, Virginia

2004 FBI Advanced Bloodstain Pattern Analysis
Scientific Working Group
Quantico, Virginia

Reno, Nevada

2002 AAFS Continuing Education
Digital Photography
Atlanta, Georgia

2002 FBI Advanced Bloodstain Pattern Analysis
Scientific Working Group
Quantico, Virginia

2003 McCrone Research Institute
Scientific Principles of Contrast in
Polarizing Light Microscopy
Chicago, Illinois

2004 AAFS Continuing Education
Ballistics & GSR studies
Dallas, Texas

Continuing Investigative Training

1985 King County ME & SD
Victim Identification in Serial Homicides
Seattle, Washington

1991 FBI Academy
Expert Systems in Law Enforcement
Quantico, Virginia

1992 Hendon Metropolitan Police Training
Training School - Terrorist Bombings
London, England

1994 AAFS Continuing Education
Multidisciplinary Investigations
San Antonio, Texas

2000 University of North Texas Police Academy
Officer Involved Shootings
Denton, Texas

2002 Defense Investigators Conference
Washington Defenders Association
Conference, Ocean Shores Washington

2003 Tactical Considerations in Fighting Terrorism
National Disaster Medical System Conference
[Fire Investigation & Thermal Injuries]
Reno Nevada

1990 AAFS & Federal Bureau of Investigation
Criminal Investigative Analysis
Cincinnati, Ohio

1991 IC/LEESA & Tampa Police Department
Applying Logic to Law Enforcement
Tampa, Florida

1993 AAFS Continuing Education
Aircraft Accident Investigation
Boston, Massachusetts

1994 Southeast Regional Crime Squad
Regional Squads of England & Wales
Luton, England

2001 ABMDI Performance Review
Pierce County Medical Examiner
Tacoma, Washington

2003 Competency of Forensic Professionals
Forensic Sciences Service, UK
Chicago, Illinois

Honors
Phi Beta Kappa
Woodrow Wilson Fellow
Rockefeller Fellow
1994 Senior Research Fellow, Department of Forensic Medicine, Guy's Hospital, London
1994 Meritorious Service Award, American Academy of Forensic Sciences
Marquis Who's Who in Science & Engineering [Reviewed]
Marquis Who's Who in the West [Reviewed]
Marquis Who's Who [Reviewed]
Manchester Who's Who [Reviewed]
Listed expert, passing AMBEST's Forensic Practice Background Investigation [Reviewed]
Exemplary Service Award, Metropolitan Police, by Det. Inspector K.P. Gallagher, SO11

Personal Statement
I am the son of an artist and a physician. When I entered college, I wanted to know how a physician could observe a patient, x-ray, or lab test, explain the malady, and prescribe a treatment. I found that philosophers addressed these methodological issues, not biologists in undergraduate premedical programs. I majored in philosophy to learn how to think, and because I found that artists' best taught the skills of careful observation so central to science, I also majored in studio art. Both skills - thinking and observing - provide a solid foundation for my graduate and post-graduate work in forensic science and forensic medicine. Death investigation suited my life long interest in the puzzles of medical diagnosis and my eventual disinterest in practicing clinical medicine. I found my niche both as a professor and medical investigator, focusing on forensic science and forensic medicine. As an independent consultant in forensic science and forensic medicine with *Final Analysis Forensics*, I apply logic and science in the service of justice.

[Additional information about Dr. Nordby's career can be found in his first book, *Dead Reckoning: The Art of Forensic Detection*, CRC Press, 1999 and in his second book, Forensic *Science: An Introduction to Scientific and Investigative Technique*, Edition 1, [especially Chapters One and Thirty] CRC Press, August, 2002; Edition 2, Chapter One]

Final Analysis Forensics - Client Base

- Department of Defense
- Individuals & families [under special circumstances *only*]
- Police Departments
- Private Attorneys
- Prosecutors Offices
- Public Defenders Offices
- Sheriff Offices
- United States Congress – House Armed Services Committee

References and Courtroom Data are available upon specific request.

Final Analysis Forensics

Death Investigation Criminalistics Forensic Analysis

[Current through October 1, 2004]

Dear Requesting Attorney,

The following represents relevant cases in which I have provided testimony, deposition, or both. Note that most of my case work, which is in criminal cases, results in some settlement before trial.

Seattle Superior Court CASE #97-1-00409-4SEA, State v. Bruce McClain

Regarding State v. Bruce McClain, the trial was held in November of 1997. I testified on November 19, 1997 in King County Superior Court, Seattle, Washington. I worked for ***Peter Klipstein***, then an attorney with The Law Offices of Donovan Bigelow. Mr. Klipstein can be reached on his mobile phone at 206-601-6126. The prosecutor in the case was attorney Ron Clark of the King County Prosecutors Office. During questioning, Mr. Clark stipulated to my expertise and called me both truthful and trustworthy.

United States District Court Middle District of Florida, Jacksonville Division, CASE # 3: -CV-538-J-21-TJC, Sewell v. City of Jacksonville

Deposition has been given on 10/16/2000. When faced with *Daubert* and *Kumho Tire* challenges, an order filed May 8, 2001, by United States District Judge Ralph W. Nimmons Jr., finds that "Dr. Nordby is qualified to testify as an expert witness under *Fed.R.Evid. 702* [limited to scientific areas described by Judge Nimmons, of course excluding mere conjecture or personal opinions], based on his knowledge, experience, training, education and skills." These areas include ballistics, injury analysis of gunshot wounds [terminal ballistics], crime scene processing and crime scene reconstruction, police policy and use-of –force guidelines. I worked for Attorney Barbara Heyer, who can be reached at 954-522-4922.

District Court, 11th District County of Flathead Montana, CASE # DC-00197B, State v. Ron Henderson

Deposition has been given on 05/2/02 with Prosecuting Attorney Ed Corrigan. I was admitted as expert witness and courtroom consultant from 5/7/2002 through 5/9/02. I testified on 5/9/2002, and was qualified as an expert in forensic medicine, ballistics, crime scene investigation and reconstruction, as well as firearms examination. I worked for Attorney David Stufft, who can be reached at 406-752-4107.

United States District Court 11th Judicial District, Sacramento California, CASE #CIVS – 00-0132 FCD GGH, Joseph Mitchell v. Union Pacific Rail Road

Deposition had been given on 06/18/02 with defending attorney William Pohle, Union Pacific Railroad. One day after my deposition, covering the ballistics of the air rifle and Diabolo pellet used in the shooting, the Union Pacific Railroad settled the case. I worked for attorney Larry Lockshin, and attorney Kim Miller, both of whom can be reached at 800-982-3777.

Superior Court for King County, Washington, CASE # 01-1-02487-2 KNT, State v. Richard Kiltau

My report was given to Attorney Michael Danko; 253-520-6509; and to prosecuting attorney Mr. Del Kolb. Deposition interviews were given on November 11, 2002. I testified at the trial before Judge Laura J. Middaugh on December 12, 2002. After testifying, Mr. Kolb and Mr. Danko each stated that my testimony was "both intellectual, and honest."

Superior Court for King County, Washington, CASE #95-C-05434-6 SEA, State v. Atif Rafay

Deposition, trial testimony *pending*: Attorneys removed and reassigned. Physical evidence and photographs together with laboratory reports were reviewed and analyzed with colleague Stuart James. New attorneys have been assigned to the case with our work forwarded to them for their potential use.

Benton County Superior Court, Washington, CASE #02-1004460, State v. Kevin Hilton

Deposition had been given on 03/04/03 with Benton County Prosecuting attorney Andy Miller, (509-735-3591). Notes were taken by Carrie Runge, assistant to Mr. Miller, and approved that same day. Trial testimony was given at the trial on March 31, 2003 in Richland Washington testifying under direct examination by attorney Peter Connick, (206-624-5958) working with Attorney Kevin Holt, (509-735-6520), with cross examination by Andy Miller.

Pierce County Superior Court, Washington, CASE # 01-1-05021-6, State v. Annette Porter

Prosecuting attorney Sue Sholin (253-798-6887) received multiple copies of my report October 9, 2002 and declined a deposition. Trial testimony was given in Superior court before Judge McCarthy on May 13, 2003 in Tacoma Washington testifying under direct examination by attorney Shane Silverthorne (253-627-2141) working with attorney Karen Schumacher of the same firm. Cross examination was conducted by Ms Sholin.

Pierce County Superior Court, Washington, CASE # 01-1-05021-6 State v. Annette Porter

Prosecuting attorney Sue Sholin (253-798-6887) received multiple copies of my report and again declined a deposition. Trial testimony was given in Superior court before Judge James Orlando on February 4, 2004 in Tacoma Washington

testifying under direct examination by attorney Michael Franz (206-246-5300) working with attorney Chip Mosley (253-272-2400). Cross examination was again conducted by Ms Sholin.

Pima County Superior Court, Arizona CASE # CR65182, State v. Arnold Araiza

Prosecuting attorneys Baird Greene & Chris Ward received my initial report before my scene visit and laboratory ballistics analyses, following up with a deposition. After additional evidence became available, they received my second report and a second deposition followed. Trial testimony was given in Superior court before Judge Deborah Bernini on March 9, 2004 in Tucson Arizona testifying under direct examination by attorney Ralph Ellinwood (520-882-2100). Cross examination was conducted by Mr. Baird Greene.

First Judicial District Court, for the County of Santa Fe, New Mexico CASE # D00101CR2000300278, State v. Ruben Sandoval

Prosecuting attorney Ms. Linda Lonsdale, Detective William Pacheco, and State's Bloodstain Expert Mr. Larry Renner received copies of my report, detailing the results of my testing, microscopic analyses, and ballistics analyses and reconstruction work. Offer of a deposition was declined by the State. State agreed to my qualifications as an expert in bloodstain pattern analysis. ballistics including terminal ballistics, forensic medicine related to gunshot wounds, trace evidence, and crime scene reconstruction. Trial testimony was given in First Judicial District Court before Judge Michael E. Vigil on April 09, 2004. Direct examination was conducted by Daniel Marlowe (505-988-1144) while cross examination was conducted by Ms. Lonsdale, 505-827-5000).

The Eighteenth Judicial Circuit Court for the County of Brevard, Florida CASE#05-1999-CF-020847-AXXX-XX, State v. Jason Tucker

Deposition had been given 06/28/04 with Prosecuting Attorneys Bill Repess and Veronica Brace for defense counsels Kepler Funk and Keith Szachacz (321-953-0104). Trial testimony is scheduled to begin 02/24/05 before Judge Jack Griesbaum.

As you may know, my practice involves providing police departments, medical examiners, public defenders and private attorneys as well as the Federal Government with both scientific analyses and relevant scientific advice, including the scientific analyses of opinions offered by other reputable forensic scientists, or by self-proclaimed "expert witnesses."

Sincerely,

Jon

Jon J. Nordby, Ph.D., D-ABMDI, Consultant in Forensic Science & Forensic Medicine