

Forensic Inference Emails 2012 - 2015 Part 1

Thomas W. Young, MD

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Preface

From December 2012 to February 2015, the home page of my website (www.heartlandforensic.com) had this message and a subscription box from aweber.com:

Forensic Inference Emails

Do you want to know:

- how you can know if someone — anyone — is telling the truth?
- how you can tell immediately that a scientist testifying in court has gotten the wrong answer?

Dr. Young would like to tell you how in a series of informative emails ***offered for free and without obligation***. If you are interested, please enter your name and email address below. New information will come to your inbox every four days. You can unsubscribe any time you want.

In 2012, I wanted to give attorneys, doctors, and others an opportunity to learn something vitally important about inference, and I wanted to do it in an entertaining way. The emails were designed to give readers enough time to read the information and absorb it. The messages avoided the more technical aspects covered in my other writings on this topic.

After 78 emails, I hope I accomplished my purpose.

I am grateful to aweber.com for providing the means to send out the emails every four days automatically.

Thank you for your interest in the topic of Forensic Inference.

Sincerely,

Thomas W. Young, MD
January 29, 2015

The Inferential Test:

One can be reasonably certain if witness accounts of the past are consistent or not consistent with physical evidence in the present, but one cannot reliably surmise past events from physical evidence unless there is only one plausible explanation for that evidence.



A Fool's Errand and How to Avoid Going On One

Have you ever been on a snipe hunt?

I have. When I was a boy scout on my first campout many, many years ago, the older scouts encouraged me to go on a little adventure with them in the middle of the night. They handed paper bags to me and a few of the other "green" boy scouts on the trip. We were instructed to crouch at the end of a meadow with our bags open, ready to capture rapidly running birds called snipes. The older boys would stand several hundreds of yards away, making noises and waving flashlights, trying to stir up the snipes so that they would run into our bags. I remember all too clearly, shivering in the cold, holding a paper bag open, waiting for those elusive birds to run rapidly into my paper bag. They never did.

A snipe hunt is one example of a "fool's errand" — an impossible task, a wild goose chase. It would be one thing if all snipe hunts were practical jokes; unfortunately, some snipe hunts have serious consequences.

Consider the photograph above of a damaged vehicle.

I have shown this photograph to many people, including forensic engineers, forensic pathologists, and accident reconstruction experts. I asked them, "Tell me how you think this car came to look like this?"

Very intently and seriously, these experts would stare at the picture and offer a variety of opinions. "Maybe the car hit a deer or another large animal" was one answer, although no explanation for why there was no front bumper damage was provided. "Maybe something fell on the hood of the car" was another response, although there was no explanation for how such a heavy falling object could deform the hood so markedly without compressing the undercarriage of the car and flattening the front tires. Some said that they would need to see more pictures of the car, perhaps look at some of the fine nooks and crannies of the car before giving a definitive answer.

Perhaps you, dear reader, have novel ideas for how this damage occurred. If you do, I can assure you that you got the wrong answer. No one has ever given the correct answer, and I do not expect that you will be the first.

At no time did these experts realize that I sent them on a "fool's errand" — a snipe hunt. To be asked to do something that is impossible is to go on a "fool's errand." These experts did not realize that I asked them to do the impossible.

Consider the following:

- There are multiple ways — potentially an infinite number of ways — that this damage could have been caused. Making the correct choice would be like pulling the correct needle from a very large haystack.
- Humans lack sufficient imagination to consider all the possible ways for the car to be damaged and look the way that it does.
- And even if an expert happened by good fortune to imagine the correct explanation, he or she would have no way of knowing whether or not he or she was correct when numerous possible explanations that fit the evidence exist.

Several years ago, I composed a statement that I call the Inferential Test:

One can be reasonably certain if witness accounts of the past are consistent or not consistent with physical evidence in the present, but one cannot reliably surmise past events from physical evidence unless there is only one plausible explanation for that evidence.

"Surmising past events from physical evidence" is something that cannot be done reliably, yet doctors (like the experts above) testify in court "to a reasonable degree of medical certainty" that they can look at organ and tissue damage in a child and determine that child abuse was perpetrated. Prosecutors and judges accept that these experts can reasonably and logically surmise past events from physical evidence because if Sherlock Holmes could do it and the actors in CSI can do it, maybe someone with sufficient training and knowledge can do it too.

Imagine prosecutors and judges out in an open meadow with paper bags!

Do you want to know what caused the damage to the 2003 Toyota Highlander? More to come...

The Shaky Science of Car Abuse

In the last email, I demonstrated to you that determining what damaged the car by simply looking at the car does not work. It is a fool's errand even to try.

Still, this does not stop some from trying.

One man — a forensic science consultant — emailed me about a week ago. He complained that the writings on my website did not emphasize the utility of "crime scene reconstruction." I replied to him that "crime scene reconstruction" from simply looking at a crime scene does not work. I showed him the picture of the damaged car and gave him the same information I gave you.

He insisted on going on the fool's errand anyway. First, he said that the image was photoshopped. I told him that it wasn't — that this damage was real and the image was not altered in any way.

He then proposed that someone used a forklift to pry the hood open after not being able to release the hood latch. The blades approached each other and the front part of the forklift squished the grill during the lift.

I told him that was not the right answer. A lift from a forklift would snap the hood latch before it would bend the hood as severely as in the picture.

Some of you perhaps want to continue on this fool's errand. Perhaps even now you are coming up with all kinds of theories.

Well, let me continue this foolishness for a little while longer. As you have been looking at the picture, have you considered the possibility of car abuse?

That's right. You heard me. Car abuse.

There is a lot of road rage out there. Think about how angry people can get. They take their anger out on their cars.

Cars can be a pain. They do not run the way you want them to sometimes. They require lots of maintenance — oil changes, new tires, new brakes, new belts, new fluids, lubrication, and so on. After a point, one can only take so much frustration.

Damaging cars is downright illegal and immoral. Car abusers need to be punished. Thankfully, there are some experts who can spot car abuse so that justice can be done.

These experts work in garages and auto body shops where car problems are diagnosed and damaged cars treated and repaired. If the experts look at a car and suspect abuse, they notify the police. Some specialize in this important forensic area and call themselves Car Abuse Mechanics.

When the police are notified, they tell car owners that they must have abused their cars because the Car Abuse Mechanics have said so. Many owners finally confess after long hours of tough questioning to kicking the tires and pounding the hood out of frustration. Immediately, these owners are arrested, found guilty by a jury of their peers and sent off to jail.

The science of Car Abuse Mechanics has evolved over many years. At one point, these experts believed that shaking a car could cause significant internal damage, making spark plugs malfunction and fluid lines break. This became known as the Shaken Auto Syndrome (SAS), and many still today end up in jail because of it. In the late 1980's, a study where dummy automobiles were both shaken and struck found that shaking alone was not sufficient to cause damage. The author of that study concluded that the "most common scenario" may be where the car is shaken before being hit (See: Duhaime AC, et al. The shaken baby syndrome. A clinical, pathological and biomechanical study. *J Neurosurg* 66:409-415, 1987).

Because of the shakiness of the shaking notion, scientists...er, mechanics...now employ "diagnoses" such as Non-accidental or Abusive Hood Injury, thereby avoiding the issue of shaking.

"Come on, Dr. Young," I can almost hear you say. "You are being absurd! What you are saying is not even probable!"

Well, maybe you are right, but which seems less probable: someone purposely damaging the hood or someone opening it with a forklift?

Furthermore, that master of forensic deduction — the great Sherlock Holmes — once said: "...when you have eliminated the impossible, whatever remains, however improbable, must be the truth" (The Sign of the Four, Chapter 6). Since the forklift scenario, the "car bumper hitting the animal" scenario, and the falling object scenario are impossible, the only thing left is car abuse, however improbable that may seem.

Right?

In the next email, I promise I will tell you what happened to the car. Pinky swear.

Promises Made, Promises Kept

I have not forgotten my promise. Here is the story behind the damaged car.

I received the photograph from a friend in an email, and the accompanying message had to do with her husband, Doug, another friend of mine.

"Doug was in a horrible accident," she wrote. "Thank God he is alive!"

After years of *affirming the consequent for complex past events (ACCPE)* — essentially going on the fool's errand I have told you about — I realized that determining past events from consequent physical evidence does not work. Frankly, I hate to be wrong, and I was not going to be wrong again.

"What happened?" I replied.

While driving his 2003 Toyota Highlander on Interstate 35 in the Kansas City area near the Cambridge Circle exit, Doug looked up and saw a rapidly spinning truck tire in mid air flying rapidly at him and his car. The spinning tire struck the hood and bounced over the occupant compartment. The car came to a standstill because the engine was destroyed from the impact. If the tire had struck the car a split second later, Doug would have been killed instantly.

Doug later learned that a fully loaded tractor-trailer moving in the opposite direction lost two tires from lug nut failure on a gradual turn.

Is the witness account consistent with the damage sustained by the Highlander? I believe it is, and I offer that opinion to a reasonable degree of scientific certainty.

Sir Isaac Newton's principle of conservation of momentum — something you may have learned in your physics class if you remember any physics — would allow a prediction that both tires separating from a truck would fly in the same general direction of the truck at roughly the same velocity as the truck. Because of the slight curve in the road, one of the tires could fly over the median to the other side of the interstate at roughly 60 miles per hour, the velocity of the tractor trailer. With Doug's vehicle traveling in the opposite direction at 60 miles per hour, the net velocity of the spinning tire at the time of impact would be about 120 miles per hour. The gyroscopic stability of the spinning tire flying through the air would stabilize its motion in a fashion somewhat like a spinning bullet flying from the muzzle of a gun — although the spin would be in a different direction. The impact to the hood would be distributed along the tread surface of the tire, and the edges of the hood would pop up like a "V" — much like the ends of a block flying together when broken by a karate chop. Since the kinetic energy of the flying tire — energy means the capacity to do work or, in this case, damage something — is proportional to the mass of the tire (over 200 pounds) and the square of its velocity (120 times 120 or 14,400 miles squared per hour), the transfer of the energy from the tire to the automobile in the form of sound, heat and metal deformation is very high and sufficient to damage the hood as severely as it was damaged.

Dear reader, we may think we are smart, but we are not as smart as we think. None of us will ever be able to conjure up a theory that explains the evidence as well Doug's witness account! Frankly, we should stop trying to invent theories and listen carefully to what witnesses say instead.

Over many years, it has gradually dawned on me that forensic science is in trouble. I would see this often in professional meetings with forensic pathologists — one group of forensic scientists of which I am a member. After viewing crime scene and autopsy photographs, many fully credentialed and highly trained forensic pathologists would offer widely varying explanations for the evidence. Forensic pathologists vary markedly in their opinions on any given case (as perhaps several of you have noticed). If scientists at NASA performed as well as forensic pathologists, we would have never put a man on the moon.

Yet forensic pathologists, child abuse pediatricians, and other forensic and medical scientists are called on by the courts to offer opinions made "to a reasonable degree of medical certainty." How do scientists know when they should be certain and when they should acknowledge that they do not know?

In 2009, I wrote a statement that answers the question above. Remember the Inferential Test?

One can be reasonably certain if witness accounts of the past are consistent or not consistent with physical evidence in the present, but one cannot reliably surmise past events from physical evidence unless there is only one plausible explanation for that evidence.

I cannot emphasize enough how important this statement is for attorneys. If you are a wise attorney, not only will you learn the principles embodied in the statement but you will also commit those words to memory. It is guaranteed to put your legal career on steroids!

I made other promises I intend to keep. I promised to tell you how you can know if someone — anyone — is telling the truth. I also told you how you can tell immediately that a scientist

testifying in court has gotten the wrong answer, even if you do not know much about science. Those are the first two promises I made on the home page of my website. Look carefully at the Inferential Test. Can you see that it provides the answers to those first two questions?

There is more explanation to clarify what I just wrote. Please stay focused and carefully consider the emails to come.

Fingerprints and Witness Accounts



Image courtesy of iStockphoto.

The first part of the Inferential Test (it is at the bottom of this email if you have not memorized it by now) says that one can be reasonably certain if a witness account or accounts are consistent or not consistent with the physical evidence, but that is not the same as saying that the account or accounts are truthful. How am I able to claim that "...you can know if someone -- anyone -- is telling the truth..." in my first promise to you?

Consider the fingerprint in the picture above. Fingerprints are simply impressions developed on objects to demonstrate the unique friction ridge patterns we all have on our fingers. They indicate that at some point in time, the fingers of a particular individual came in contact with a particular item. Comparing fingerprints from a crime scene with the known fingerprints of an individual for identification is similar in many ways to comparing witness accounts with physical evidence for learning the truth.

Fingerprints are highly complex and unique to an individual. They are not only composed of loops, whorls, arches, and other general patterns but they also demonstrate complex branching. This branching makes it possible to select one individual from a multitude of individuals.

Different branches of the fingerprint in different areas can be characterized as discrete points of information or data. If the points of data from a fingerprint at a crime scene do not match comparison prints even in one relevant point and if the fingerprint interpretation is proper and coherent (coherent means it "makes sense" with other information), then the individual considered can be "ruled out."

On the other hand, "ruling in" is not so easy. Although "ruling out" can be done with only one relevant discrepancy, "ruling in" requires numerous data points to make it more and more likely. Multiple data points from a complete and clear print technically do not guarantee identification but only make it more likely — approaching certainty with additional data but never quite reaching it.

The likelihood for identification, however, can get so high that it becomes the only plausible explanation for an identification (look at the last part of the Inferential Test). If the odds of an identification are one million to one, it makes the identification essentially certain, provided that all of the circumstances make sense for it to be certain. Sufficient DNA and fingerprint evidence

are examples of items meeting this test. If you want to "look beneath the hood" and understand the logic behind what I just wrote, please consider carefully the writings on my website in the Forensic Inference series, particularly the one on "Diatoms and Retinal Hemorrhages...".

Investigators collect information from witnesses and from physical evidence at a crime, death or accident scene. Pathologists perform autopsies and observe physical evidence from the body. All of these items — both memory or anamnestic evidence from witnesses and items observed by investigators and scientists at a scene or an autopsy (physical evidence) — can be compared with each other like a fingerprint. If there is one relevant discrepancy, it can be declared with certainty as being not consistent, and if items match up, they can be declared with certainty as being consistent. If numerous data points match up and there are no relevant discrepancies, then the witness accounts are probably truthful. The more information that is available, the greater the likelihood for learning the truth.

When I heard the information about Doug's car accident from Doug and his wife, I did not question it. Multiple people saw portions of what happened from varying perspectives. Multiple accident investigators observed the physical evidence from the event, involving numerous items of data. Personally, the information I heard from Doug was sufficient and made sense with the physical evidence. There were no relevant discrepancies. Not even one. Of course, I believe the account. It represents the only plausible explanation.

I hope you recognize that having the assistance of a scientist or other expert who infers properly is not only helpful but essential. You might not understand Newtonian physics, so it is helpful to have the assistance of one who does understand it. You might not understand autopsy evidence or other forensic evidence without help from scientists. It is important to have help from a scientist who infers properly — who compares witness accounts to physical evidence — rather than from those who do not infer properly — who invent theories from physical evidence. By now, you should be able to tell the difference, allowing you to make the proper choice of helpers.

Consider the difference between a *fact* and a *belief*. A fact is something that is directly observed — by witnesses, investigators or scientists. A belief is something that is not observed that may or may not be true (often not true). Comparing witness accounts to physical evidence is comparing facts to facts, therefore making the witness accounts more probable for truth. Surmising past event scenarios from physical evidence is developing beliefs from facts — beliefs that are highly likely to be wrong. A *theory* is a set of multiple beliefs.

Imagine using a fingerprint to create a theoretical human being around it. That would be absurd, wouldn't it? The fingerprint might match or confirm your theoretical person but that would lead us along a path we should not travel. We will consider the problem of confirmation bias in the emails to come.



The Basics of Bias

Image courtesy of iStockphoto, gavran333

What is bias?

According to the dictionary on my computer, bias is "prejudice in favor of or against one thing, person or group compared with another, usually in a way that is considered to be unfair." Prejudice is further defined as "preconceived opinion that is not based on reason or actual experience," and it further involves "dislike, hostility, or unjust behavior formed on such a basis." Notice the terms, "unfair" and "unjust."

Without further ado, here are the Basics of Bias:

Bias requires ACCPE. As you may recall, ACCPE means "surmising past events from physical evidence" — a fallacy described in the portion of the Inferential Test following the word, "but." If there is no ACCPE, there is no bias. Plain and simple.

How do I know? Because ACCPE involves forming "beliefs" and "theories" from "facts." Facts as you may recall are items that are directly observed, therefore highly probable for truth. Beliefs and theories are items that are not observed that may or may not be true (and are often not true). If done properly, comparing witness accounts to physical evidence (a process that is *not* ACCPE) is comparing facts to facts. If a witness lies, it often is easily demonstrated after comparison with the physical evidence that one or more items were not something he or she actually observed; therefore, those items are not considered factual. This, of course, presumes that there is sufficient information in the form of witness accounts or physical evidence.

Comparing witness accounts to physical evidence and saying that something fits or doesn't fit is deductively valid, so one can be reasonably certain. If one can be reasonably certain in a valid way — guaranteeing if items are consistent or not consistent — and if one does this truthfully, honestly and with appropriate knowledge, there is then no available opportunity for bias. One's preference for a particular outcome becomes irrelevant.

On the other hand, bias from ACCPE is like using a boomerang to hit a bull's eye — not something that is easily done, reliably done, or likely to be successful. The bend or bias in the boomerang path ensures a bad result.

No one can claim to be unbiased. This is because we are all fallible humans. Our knowledge is limited, and we are subject to a variety of social pressures. Opinions offered to a reasonable degree of medical certainty are beliefs, and those beliefs may or may not be true.

Personally, I accept that I am biased. I am biased to believing someone is telling the truth until it is demonstrated to me that the account is not truthful. Even if the account is not entirely truthful, I will bend over backwards to give someone the opportunity to tell the truth — even confronting a person with the facts. I am also biased for an outcome of "not guilty" over "guilty" in my consultation cases. Technically, the court is supposed to prefer the same outcome as I prefer because they instruct jurors to presume innocence before proof of guilt. Over many years as a medical examiner, I had done my best to presume truthfulness in people — witnesses, employees, colleagues, etc. — until the falsehood was demonstrated. This approach works because it is relatively easy to demonstrate that a person's account is false — to "falsify" it — with physical evidence and other witness evidence. It is hard for a person to prove that he or she is telling the truth, so it is right morally to presume the truth from people.

Confirmation bias. This is a special form of bias often seen in court. With confirmation bias, one party invents a theory through ACCPE and another party confirms it. Somehow, this

confirmation establishes the theory as reliable and truthful in the minds of jurors. I break down confirmation bias into three types.

Type 1: Law enforcement provides the theory and the scientist confirms it.

Type 2: The scientist provides the theory and law enforcement confirms it.

Type 3: A person or party provides both the theory and the confirmation of it.

I used the word, "confirmation," in an incorrect sense above because it is impossible in truth to confirm any theory formed by ACCPE, just as it is impossible to confirm the cause of what happened to Doug's 2003 Toyota Highlander by looking at the damage. Still, the vast majority of scientists and law enforcement officers believe what they do really works and they think such confirmation is reliable.

In the emails to come, I will provide you with examples of each type of bias and will offer suggestions as to how you can expose the bias to jurors on cross examination. Please stay focused and keep reading.

By the way, how is it that you can know immediately that a scientist has gotten the wrong answer without you knowing much about science? That was my second promise to you, remember?

It should be obvious by now. If a scientist develops a theory of what past events led to the physical evidence — even physical evidence that you might not completely understand — the scientist and his theory are wrong. You can count on it, thanks to the Inferential Test.

Confirmation Bias, Part 1

Do you remember the three types of confirmation bias? If not, here is a review:

Type 1: Law enforcement provides the theory and the scientist confirms it.

Type 2: The scientist provides the theory and law enforcement confirms it.

Type 3: A person or party provides both the theory and the confirmation of it.

In Types 1 and 2, the relationship between the "theorizer" and the "confirmer" is important. In a very general sense, think of the "theorizer" as the "master" and think of the "confirmer" as the "servant." The self-assured master invents the theory, and the servant serves the theory.



Consider these as general "rules of thumb":

- The master is dominant; the servant "goes along to get along."
- The master has more resources than the servant.
- The master is more politically powerful than the servant.
- The master's theory is more superficially plausible than the servant's confirmation of it. Theorizers prefer not to invent implausible theories because they are not persuasive.
- The master often explicitly or implicitly persuades the servant and others on the basis of experience tainted by Type 3 Confirmation Bias. More on that later.

When preparing to cross-examine investigators and scientific experts, the attorney should examine their relationship. An examination of the timeline of a case investigation — including what was specifically said to whom, when it was said, who said it, how it was said — should provide the kind of data that would allow the jury to understand the nature of the relationship. Does that relationship fit some or all of the characteristics described above? And if it doesn't, where and how does it differ? Also, since the evidence provided by the servant confirmer is often weaker than the theory indicates, that evidence is much easier to attack. Please understand, however, that there are also plenty of opportunities and ways to demonstrate the weakness of the theorizer.

One way (and the most important way, in my opinion) is to show the judge and jury that "one cannot reliably surmise past events from physical evidence." This is hardly ever done by defense attorneys, but I hope with these emails many of you will gain confidence to try it more often.

Other than that, the defense attorney can simply return to the facts of the case — those items in a case observed directly by multiple eyewitnesses that are highly probable for truth. Confront both investigators and scientists — particularly the one in the servant confirmer role — with the facts in front of the jury. The facts can easily falsify the opinions of consequent-affirming experts and investigators. Be sure to obtain the assistance of a scientific consultant who infers properly.

Let's now talk about Type 1 Confirmation Bias (CB1).

Police officers love to show up at the autopsy, not only to see the evidence but also to tell the pathologist their "side of the story." Frequently with CB1, the pathologist either has no investigators or has a weak and inexperienced crew, so he eagerly soaks in the "information" provided by the officers. Most pathologists do not have the time to learn primary witness accounts or to examine the scene, so they have to rely on the hearsay of others. There is also an eagerness on the part of the pathologist to cooperate fully with the investigation. In an effort to do this, the pathologist carefully — often very, very carefully — examines the body in order to support the police officers' "side of the story" — looking for subtle evidences of strangulation or bruising, for example, to support an assault theory.

Bob Dylan once wrote in a song, "...it may be the devil or it may be the Lord, but you're gonna have to serve somebody." Pathologists in this situation often know that their income and employment rests on remaining in the good graces of law enforcement and the prosecutor. Satisfying the police officers at the autopsy table is one of those ways of remaining gainfully employed.

Take a look at the photograph above from an autopsy. Police officers found the body of this woman in a shallow grave, and they were directed to the grave by the boyfriend. The pathologist declared to the police at the autopsy table that the red mark passing transversely across the neck was a ligature mark and that this was a case of ligature strangulation.

According to the boyfriend, he got into an argument with the woman, and she became unresponsive brief moments after he grabbed her by the neck with his hand. This kind of sudden collapse can occur for a variety of reasons, but that is beyond the scope of this discussion. He decided to conceal the body by digging a shallow grave. Police officers did not share the boyfriend's account with the pathologist.

Amazingly enough, photographs of the body in the shallow grave revealed the condition of the body before decomposition. Photographs taken at the grave site showed no marks in the neck. The marks developed later from decompositional color changes involving natural skin folds.

Next email, we will consider CB2 which in many ways is distinctly different from CB1.

Confirmation Bias, Part 2

With Confirmation Bias, Type 1 (CB1), law enforcement is the master and the scientist is the servant. Confirmation Bias, Type 2 (CB2) — where the scientist is the master and law enforcement is the servant — involves a whole different dynamic.

CB2 frequently involves issues with children, specifically "child abuse." Child abuse pediatricians and board-certified forensic pathologists working in accredited offices are the masters.

Children's hospitals do not have to please police officers because their livelihood does not depend on police or prosecutors. Also, a community with a highly professional and accredited death investigation office (like the one I got to run in Kansas City for many years) greatly supports the independence of the medical examiner from prosecutors and law enforcement. Highly professional organizations have many resources at their disposal. Computed tomography and magnetic resonance imaging scanners, other physician consultants, in-house laboratories, and a well-trained and experienced cadre of medical examiner investigators are examples of a few of those resources.

Scientific experts from these settings who are called as witnesses by the prosecution are formidable and difficult to cross-examine effectively. Jurors already respect them and tend to look favorably upon them. Because of sophisticated scientific knowledge that most people do not understand, these experts are able to fool jurors very effectively if they need to.

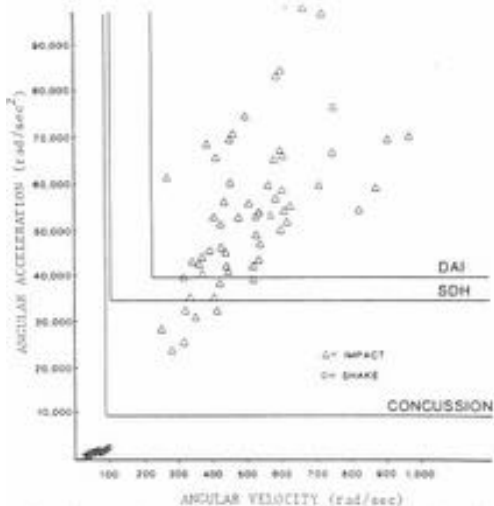


FIG. 2. Angular acceleration versus angular velocity for shakes and impacts, with injury thresholds from primate experiments scaled to 500-gm brain weight. DAI = diffuse axonal injury; SDH = subdural hematoma.

Police officers are at the beck and call of these scientists. Whenever one of these highly respected doctors calls a case "child abuse" or "non-accidental injury," the police put pressure on the suspects with the aim of getting them to "confess." Such "confessions" involve getting the suspect to agree with the theory of the scientist. The confession is the confirmation.

This is the part of the email where I confess to doing a horrible thing. My ignorance of what I was doing at the time is my only excuse.

In 1995, I performed an autopsy on a six-week-old infant girl who was found unresponsive in her crib by her mother. In spite of rescue attempts after notifying paramedics, the infant was pronounced dead in the hospital emergency department.

An autopsy disclosed blood clots over the surface of the brain (subdural hemorrhage), hemorrhage beneath the filmy coverings of the brain (subarachnoid hemorrhage), hemorrhages in the back of the eyes (retinal hemorrhages), subdural and epidural hemorrhages in the cervical spine of the neck, healing fractures in the ribs near the spine (posterior rib fractures), and multiple healing fractures in the arms and legs. There were no significant external injuries, scalp tears, or skull fractures. I concluded on the basis of this autopsy that the child died from head injury characteristic of the shaken baby syndrome. I determined that this death was not accidental, that it involved "a very severe whiplash type of injury event," and that the baby would not be expected to eat, awaken, or respond immediately after such an event.

I was not even cross-examined. The conviction was upheld on appeal.

At the time, I did not know the following:

- Human beings cannot generate with shaking the kinds of accelerations sufficient to cause subarachnoid and subdural hemorrhages (Duhaime, et al. The shaken baby syndrome: a clinical, pathological and biomechanical study. *J Neurosurg*, 1987).

Look at Figure 2 of that article in the image above. It is a graph showing acceleration thresholds for getting "knocked out" (concussion), subdural hemorrhage, and diffuse axonal injury. The triangles are the impacts and the circles clustered in the lower left-hand corner of the graph are the shakes. No one shaking a dummy could even come close to the accelerations for the "knocked out" level, let alone the subdural hematoma level.

- Subdural, subarachnoid and retinal hemorrhages may be caused by hypoxia (lack of oxygen) and ischemia (lack of blood flow) in a young infant (Cohen MC, et al. Subdural hemorrhage, intradural hemorrhage and hypoxia in the pediatric and perinatal post mortem: Are they related? *Forensic Science International*, 2010. Matshes E. Retinal and optic nerve sheath hemorrhages are not pathognomonic of abusive head injury. *Proceedings of the American Academy of Forensic Sciences*, 2010). Trauma is not required. There are explanations that are too numerous to count for breathing or blood circulation ceasing in an infant, even temporarily.
- Epidural hemorrhages in the cervical spine are a frequent autopsy artifact (a "not real" finding) in an infant.
- Fractures can occur with minimal trauma during the first 6 months of life because of a wide variety of nutritional and metabolic bone diseases, and the fractures can occur during the birth process (remember that there were *healing* fractures in a *6-week-old*) (Miller ME. The lesson of temporary brittle bone disease: all bones are not created equal. *Bone*, 2003).

Admittedly, several of these studies came out well after 1995, and I didn't appreciate the Duhaime study until I looked at it closely many years later. I also now realize that "one cannot reliably surmise past events from physical evidence unless there is only one plausible explanation for that evidence." I thought trauma was the only plausible explanation. Clearly, it wasn't. I will explain the "unless..." phrase in the next email.



The Only Plausible Explanation

According to the Inferential Test, it is acceptable to determine a past event from physical evidence if that explanation is the only plausible explanation. Notice that I said "past event" and not "past events."

What does "the only plausible explanation" mean?

It means that another past event would be impossible or at least highly implausible. It means that all witness accounts have been learned, all physical evidence has been gathered, and the physical evidence has been compared to the witness accounts. After all of that, if there is only one event or explanation that is plausible even though it was not directly witnessed, then that explanation can be offered to a reasonable degree of medical or scientific certainty. This is a tough standard.

And even if a scientist has done her best to collect all available evidence and compare facts to facts, even if she is left with only one plausible explanation, how does she know that there is not another plausible explanation out there that has not been considered or even imagined? That very question should prompt the scientist to be very, very careful when applying the "only plausible explanation" rule.

Back in 1994, when I worked in Atlanta, the mother and grandmother of a two-year-old male reported that they found the child unresponsive. Rescue personnel responded and took the child to the hospital where he was pronounced dead. Medical personnel found no evidence of injury, but they suctioned a small amount of bloody fluid from the child's stomach.

The image above represents one of autopsy findings. Multiple abrasions matching the sizes and configuration of the child's teeth were found in the linings of the upper and lower lips. I contacted the police following the autopsy and told them that the finding was suspicious for foul play, perhaps a smothering. The police at that point refused to investigate unless I called it a homicide.

How could I call it a homicide? There could be many possible explanations for that finding. What evidence did I have that it was related to the child's death? This was not like having a hole in the heart with massive bleeding.

Long before the Inferential Test, I realized that I needed to interview multiple witnesses. The paramedics claimed that not only did they not press the child's lips against the teeth but they also discovered the abrasions while they were at the apartment. I visited the apartment and

found nothing there to explain the abrasions. I interviewed the mother and grandmother separately. They provided me with a continuous timeline of events extending back several days and offered nothing to account for the lip abrasions. The child was reportedly happy and in his usual state of health when he went to bed. He had even eaten potato chips shortly before bedtime without any difficulty. The child reportedly cried at 11 to 11:30 PM, and the mother allegedly had to soothe him gently back to sleep (the grandmother was already asleep at that time). Somewhere around 2 to 2:30 AM, the mother "sensed" that there might be something wrong, so she got out of bed to check on the child. That was when she found the child unresponsive.

I pointed out the abrasions in the lips, showing them the image above and other images at the end of the interviews. Was there anything at all that could explain this injury? Was there any point in time where either might have pressed the child's lips against his teeth? Both very carefully denied any event that could have led to that injury. I asked them to think about it over the next several days and to call me if they could think of anything — anything at all.

When they didn't call after five days, I called it a smothering homicide. After all of the relevant evidence was examined and after considering the extensive witness interviews, I could think of no other plausible explanation that would account for the abrasions.

Perhaps that was a gutsy thing to do. The police sat down with the mother and grandmother and told them of my determination. The police wanted an explanation.

Both the mother and the grandmother showed no evidence of deception on lie detector testing. Several days later, the mother mentioned that when the child was crying at 11 to 11:30, she placed her hand on his mouth to stifle him. The muffled child raised up in the bed, and she pushed him back down with her hand against his mouth. He raised up again and she pushed him back down. Eventually, the child did not cry anymore, so she went to bed. When the police asked her why she didn't give this information to me when I asked for it, she claimed that she didn't feel it was important.

The mother was charged, and she pled guilty. Needless to say, her statement later offered to the police was consistent with the physical evidence.

In other kinds of child abuse cases, pediatricians and forensic pathologists make the mistake of claiming that there is no other plausible explanation but child abuse for subdural and subarachnoid hemorrhages, retinal hemorrhages, brain swelling, or multiple healing fractures. I made that mistake in the case I described in the last email. The problem is that the developing infant is complex; there is a lot that could potentially go wrong — even conditions of which we are currently not aware. Some of the problems may yet to be discovered by modern medicine at the time the autopsy is performed. It is not reasonable to implicate child abuse as "the only plausible explanation," even after running a few laboratory tests to eliminate a few other theories that may come to mind. How do we know what is below the tip of the iceberg?

Using the "only plausible explanation" rule is not an excuse for surmising past events from physical evidence without carefully investigating witness accounts.



, but not



unless



The Inferential Test in Pictures

Dear reader, do you understand?

If you don't, please feel free to email me any questions you may have.

There is more to come. Soon we will cover "Confirmation Bias, Part 3." You won't want to miss that email because after reading it, you will look at the scientific literature about child abuse and other past event topics in a whole new way.

But before we get to that, what happened with the investigation of the Kennedy assassination? I will cover that in the next email.

What Happened With JFK?

Image courtesy of iStockphoto.com, AnthonyTX.

One of the first persons to sign up for these emails asked me to comment on the investigation of the John Fitzgerald Kennedy assassination. This investigation is controversial and has spawned numerous conspiracy theories over many years. Is there anything that an application of the Inferential Test can tell us about the assassination?

First of all, no one directly witnessed Lee Harvey Oswald, the alleged "lone gunman" according to the Warren

Commission, to have shot the president. This is a problem. The alleged "lone gunman" could have been the lone direct eyewitness. The opportunity to question him in a way that would be suitable for comparing his account to the physical evidence for consistency or inconsistency had passed.

Oswald would have been the one person who would know if he had shot the president. He denied shooting either the president or a police officer who he was alleged to have shot shortly after the president was shot. Oswald was interrogated several times over two days at Dallas Police Headquarters before he was shot and killed by Jack Ruby. The police found several "holes" in Oswald's account — not surprising because police interrogations frequently consist of

police officers trying to get the suspect to support their theory of a case. Could Oswald have been lying? Sure, but people lie for many reasons, particularly when under the threat of being imprisoned. Being caught in a lie is not the same thing as being the shooter.

Since that time, conspiracy theory after conspiracy theory has been launched in order to make up for the lack of direct witness accounts. Conspiracy theories are ACCPE (Affirming the Consequent for Complex Past Events, "surmising past events from physical evidence") and are frequently very complex. As such, past-event theories have a low probability of being true because of their complexity. Feel free to look at the article I wrote on "Diatoms and Retinal Hemorrhages..." for a mathematical demonstration of the low probability.

Even the Warren Commission report is ACCPE. The report involves a carefully woven scenario to explain various physical evidence findings, including the discovery of a bolt-action rifle on the 6th floor of the Texas School Book Depository (the building pictured in the image above) and Oswald's behavior upon leaving that building.

Along with this are numerous items of physical evidence, including both autopsy and ballistic findings and film footage of the shooting. These data have been used to support one theory or another of what happened rather than for testing any direct witness account. This often leads to confirmation bias, as we have already discussed.

The JFK assassination case is essentially a very complex circumstantial evidence case. Circumstantial evidence means that there are no direct eyewitness accounts of the deed in question. Witness accounts in such cases are often indirect and insufficient, as they were in the Kennedy assassination case. Circumstantial evidence cases can be reliable providing that a thorough and extensive witness and physical evidence investigation leads to one and only one plausible explanation. Was that test met with the Kennedy assassination investigation? Probably not; otherwise, the data would be persuasive and conspiracy theories would not abound to this day.

Forming "rule-of-thumb" theories at the outset of an investigation is useful because it allows a consideration of leads to pursue, but investigators and forensic scientists should resist settling on a theory. Once a theory is declared, witnesses who are concerned that they may be arrested and found culpable will alter their behavior, including "lawyering up" and refusing to say any more about a case. Forensic pathologists who declare a case publicly to be a homicide may cause leads to dry up and a thorough inquiry to be impossible. If there is insufficient data — either witness or physical evidence data — a reliable determination for what happened becomes impossible. Insufficient witness or physical evidence is like a partial or smudged fingerprint — the examination of either is unreliable. Without sufficient evidence, all that is left are theories, and such theories are not likely to be true.

Consider what happened to Lee Harvey Oswald. The police thought they had their man and they announced it. This led to widespread media coverage and the subsequent assassination of the only known potential witness. Jack Ruby thought he did us all a favor, but he didn't. Neither did the police. What would have happened if the police had done a thorough canvass of the area rather than settling too soon? What if they had investigated the grassy knoll business? Who knows what the outcome would have been?

The quality of the physical evidence for the Kennedy assassination investigation has also been questioned over the years, including the controversial moving of the body to Bethesda, Maryland, the performance of the autopsy by inexperienced military forensic pathologists, and the lack of important detail; nevertheless, even if the autopsy had been sufficiently thorough and well documented, the use of that information to support a theory is still dubious. Analyzing

physical evidence for the purpose of confirming a theory is not reliable and does not work. One day, even forensic scientists will figure this out.

Stay tuned for more important information about confirmation bias in the emails to come.

Confirmation Bias, Part 3

Image courtesy of iStockphoto.com, AnthonyTX.



(The image above shows the window on the sixth floor of the Texas School Book Depository from where -- according to a *repeatedly confirmed official theory* — Lee Harvey Oswald shot President John F. Kennedy.)

Confirmation bias, type 3 (CB3) — where the same person or party inventing a theory confirms it — follows this general pattern:

- A person or party comes up with a theory.
- Any evidence that supports that theory is acknowledged.
- Any evidence that negates that theory is dismissed.
- When the theory demonstrates "success" or "victory" in any form, that further confirms the theory as a mandate.
- Failure of the theory is never recognized.

Who engages in CB3?

All of humanity does it. Beliefs about politics and religion, for example — beliefs that often extend as far back as childhood — are often reinforced throughout one's life and not often falsified. This is why it is pointless to argue with anyone about politics and religion: no one is likely to be persuaded.

Law enforcement does it. Lee Harvey Oswald, for example, was arrested not on the basis of any eyewitness account of him shooting the president but on a theory. There was no careful analysis of all evidence prior to the arrest, but government at multiple levels justified the arrest in the years to follow.

Prosecutors do it.

I know many of you prosecutors are reading this email right now as you prepare to try a case where I may testify. Tell me something: How likely is it that you will win the lottery if you were to buy a ticket?

Not likely but possible, you say? Now tell me something else: *How likely is it that you will determine the winning lottery number — or for that matter, the person who will win the lottery — before the balls are cast?* Now that is impossible, right?

This is a lot like what you do in court all the time: you develop a theory for complex past events you have never seen personally and you claim before a jury that your theory is right — even though the probability of such a theory being right is very, very, very low (see "Diatoms and Retinal Hemorrhages..." in the Writing section of my website).

But you find witnesses who agree with you and you ignore or minimize witnesses who don't agree with you. You even attack the witnesses who don't agree with you, using every trick in the book to fool twelve men and women.

Sir or madam, if you do this, you are not a public servant. You are a public menace. If justice is done, you should be handcuffed and thrown in jail because you are a serial destroyer of lives.

Oh, I know: you think you are "doing your job." God help us all when you do your job! Maybe you should select another job — one where you will actually do some good.

But you won't do that. Smugly and self-righteously, you will win at any cost. Every conviction is not only a mandate for your smugness and self-righteousness but it is also job security: your boss needs to get re-elected as the "tough" prosecutor, and you want to keep your job at all costs. If that is why you persist, you are a pathetic coward and you should be ashamed of yourself!

Thanks for allowing me to vent. Who says you can't be passionate and logical at the same time?

Who else does CB3? Scientists do it.

"In my experience..." are words you will often hear a pathologist say when he or she testifies in court. Do you know what such experience often is? That's right: Confirmation bias, Type 3. The experience of a pathologist who repeatedly affirms the consequent for complex past events (ACCPE) is deadly. There is no self-correction with such self-confirmation. There is no self-correction when one does not recognize failure. And believe me or not, there are some pathologists who are never, ever wrong in their own minds. Many prosecutors believe such scientists make the most persuasive witnesses!

But it gets worse.

Physicians and other scientists reinforce theories of "child abuse" in the medical literature through CB3, thereby compounding the "experience" problem. Many of the published articles on this topic — accepted and confirmed through peer review — are filled with such bias, although the appearance of it may often be subtle. I will address the medical literature in the next email and in future emails.



How Science Stays “Stuck on Stupid,” Part 1

Image courtesy of iStockphoto.com, MachineHeadz

*"Mama always said, 'Stupid is as stupid does.'"
— Forrest, Forrest Gump*

When I was the chief medical examiner in Kansas City, one of my autopsy aides often provided colorful insights on the human condition. He did not have much in the way of a formal education, but he possessed a common sense not often seen among many who are educated.

On occasion, he would point out some learned person and comment, "Doc, that man is stuck on stupid!"

Scientists stay "stuck on stupid" year after year, thanks to Confirmation Bias, Type 3. They develop theories from physical evidence (ACCPE, Affirming the Consequent for Complex Past Events, "Surmising past events from physical evidence"), then they compound that fallacy by publishing compilations of these cases. This is much like scientists studying numerous cars with hood damage (like Doug's 2003 Toyota Highlander discussed in the first email), then publishing their experience to describe the characteristics and diagnosis of car abuse!

Besides ACCPE, such studies are filled with logical fallacies. Many of these fallacies are subtle and require a close inspection of the "Materials and Methods" section of the article to discover them.

A good example of this problem is a peer-reviewed study from 2007, entitled "Lack of Evidence for a Causal Relationship Between Hypoxic-Ischemic Encephalopathy and Subdural Hemorrhage in Fetal Life, Infancy, and Early Childhood" (*Pediatric and Developmental Pathology* 10:348-350, 2007). The title already indicates a logic problem: a "lack of evidence" is not evidence (classic *ad ignorantiam* fallacy, where a statement is false because it hasn't been proven to be true). In other words, hypoxic-ischemic encephalopathy (brain damage due to lack of oxygen and blood flow) does not cause subdural hemorrhage in fetuses and children because they found no evidence that it does. Can you wrap your mind around that one?

Oh, but it gets weirder.

The first sentence of the abstract states, "It has been asserted that hypoxic-ischemic encephalopathy (HIE) with cerebral swelling in the absence of marked trauma may be responsible for subdural hemorrhage in the young." This is in reference to the work of Dr. Jennian Geddes and others in the United Kingdom. They previously published cases where infants and small children on respirators for natural diseases associated with hypoxia (lack of oxygen) and ischemia (lack of blood flow to an organ like the brain) — such as heart disease or asthma — were found to have thin subdural hemorrhages at autopsy. This did not occasionally happen; it often happened. Because of this, Dr. Geddes wondered if many of the subdural hemorrhages related to Shaken Baby Syndrome might be due to a lack of oxygen and blood

flow to the head. Such an idea posed a threat to the theory that trauma was the only cause of subdural hemorrhage and that child abuse was "the only plausible explanation" for the "triad" of subdural hemorrhages, brain swelling and retinal hemorrhages (brain swelling was already a condition often associated with HIE).

The final sentence of the abstract for the study concludes, "In this study no support could be given to the hypothesis that HIE in the young in the absence of trauma causes subdural hemorrhage." That, of course, was due to the "lack of evidence" they discovered. After studying numerous cases from medicolegal autopsy settings all over the world (this is a multi-author study, where scientists worldwide compiled their experience), *they did not find a single case* where subdural hemorrhages were associated with HIE: "A retrospective study of 82 fetuses, infants, and toddlers with proven HIE and no trauma was undertaken from forensic institutes in Australia, the United Kingdom, Germany, Denmark, and the United States...In no case was there macroscopic evidence of subdural hemorrhage."

Wow! Is that amazing? Or is that just stupid?

Consider this:

- Traumatic cases were not considered in the study.
- Head trauma was diagnosed in infants and small children by the presence of subdural hemorrhages (ACCPE), so
- All the cases of subdural hemorrhage were removed from the study.

This is an example of a circular argument. It is "begging the question" — assuming the conclusion as a premise used to draw the same conclusion. I like to think of circular argument problems like this as "the cycle of rot." There was an absence of cases where an absence of trauma led to subdural hematomas because only trauma causes subdural hematomas.

Got it?

If these scientists understood the Inferential Test, they wouldn't come up with such stupid studies. Stupid peers review stupid studies and publish stupid peer-reviewed studies.

More to come...

How Science Stays “Stuck on Stupid,” Part 2

I feel sorry for attorneys who have scientific literature articles to contend with as they try to defend their clients. Often, these studies are not only confusing but also confused.

In the last email, I discussed problems with begging the question or circular argumentation — where the item to be concluded is accepted as a premise for the item to be concluded. I like to think of a dog chasing his tail when I think about this problem because scientists are often no smarter than the dog.

Take, for example, a study by forensic pathologists published in 2010 about cardiopulmonary resuscitation (CPR) in infants and children. The title, "Do Resuscitation-Related Injuries Kill Infants and Children" (*American Journal of Forensic Medicine and Pathology* 31(2):178-185,

2010) is misleading because the concern was not really if injuries from CPR kill children: The children required resuscitation from whatever killed or was killing them. Instead, the question of the article was whether or not injuries from CPR could be confused with child abuse — the so-called "CPR defense."

The authors studied all child deaths in their jurisdiction, 18 years of age and under, over a 10-year period, totaling 1,515 cases. *They removed all children who died as a result of trauma* from the study, so they removed 969 cases, leaving a non-trauma group of 546 cases.

Then they took the 546 cases and divided them into cases where there was CPR (382 cases) and cases where there was no CPR (164 cases). Among the 382 cases with CPR, they further subdivided those who had CPR from "trained" individuals (physician, nurse, EMT, fire-rescue or law enforcement; 248 cases), those who had CPR from "untrained" individuals (people instructed, for example, by 911 operators; 1 case) and from a combination of "trained" and "untrained" (133 cases).

Do you know what they found?

None of the cases with no CPR (164 cases total) had injuries to the face, neck or internal organs of the chest and abdomen, nor were there any rib fractures. No surprise here because these were all cases with no trauma and no CPR.

Nineteen of the cases where there was CPR (382 cases total) had **22 findings** -- mostly tears, scrapes and bruises to the face, mouth and neck (15 cases), bruises in the lungs (4 cases), air in the soft tissues below the breast plate (1 case), and scrapes to the front of the chest (2 cases). There were no rib fractures. With so few cases found, it would not seem likely that anyone should confuse injuries from CPR with child abuse. Certainly, you shouldn't blame CPR in children if there are rib fractures!

Right?

What is amazing is that the same forensic pathologists performing this study would think nothing of seeing a dead adult with rib fractures, a torn-up liver, or a torn-up heart and blaming the CPR. They would attribute the death to the heart disease for which resuscitation was required. They wouldn't attribute it to "adult abuse." Not so with children apparently, even though they are much more delicate than adults.

What is also amazing is that I receive in consultation many cases in which frantic "untrained" parents and other caregivers rendered CPR with instruction over the telephone from a 911 operator, yet this study from a busy jurisdiction found only **1 case** in 10 years where an "untrained" person rendered CPR. Only one!

Do you see the problem?

If the examiners already accepted through ACCPE that rib fractures and organ damage are caused by child abuse, they won't see those cases in their study because they are among the 969 trauma cases removed from the study.

Think of all the people in that jurisdiction who frantically tried to save their child through the help of a 911 operator -- only to be accused of child abuse at a later time!

I wrote a letter to the editor in response to that study (*American Journal of Forensic Medicine and Pathology* 31(4):e6 — notice that it was only published electronically and not printed), pointing out not only the fatal flaw but also how the study should have been designed. No case

should have been eliminated. Each of the 1,515 cases should have undergone a thorough comparison of witness accounts with physical evidence for consistency or inconsistency, as mentioned in the first part of the Inferential Test. All cases with injuries consistent with reported resuscitative efforts and no inconsistencies should have been reported in full case-report fashion. It should be assumed at the outset that it is possible for CPR to cause injuries because they can in adults and because this is what is supposed to be studied. Such a study as I recommended would have been simple and helpful, not confused and confusing.

Forensic pathologists are not the only ones making these mistakes. Wait until you see what child abuse pediatricians do in their literature!

How Science Stays “Stuck on Stupid,” Part 3

Forensic pathologists are not the only doctors "stuck on stupid." Our stupid candle may flicker on occasion, but it is nothing compared to the blowtorch of numerous health care providers, particularly pediatricians in children's hospitals.

Enshrined in the ivory towers of academe and children's hospitals everywhere lies the Most Holy Church of Child Abuse. Like many churches, this one has its own doctrine and catechism. It even has its own priesthood, where three years in the life of a pediatric acolyte — three additional years of pediatric training — may be spent understanding the "mysteries" of child abuse. The believers in this church have their own gatherings and confabs, where not much praying goes on.

Celebrants in the Most Holy Church search their own set of scriptures — the pediatric medical literature — where ACCPE and circular reasoning confirm the deeply held beliefs of the faithful. Over many, many years, dogma has spewed forth from its yellowing pages, such as:

- Shaking infants and children leads to the Shaken Baby Syndrome -- a "triad" of subdural and subarachnoid hemorrhage, brain swelling and damage, and retinal (back of the eye) hemorrhages.
- Although shaking damages the brains of children, impacts from short-distance falls rarely — if ever — cause harm (so don't believe anyone who claims that the short-distance fall led to the brain injury or death).
- Infants and children *immediately* behave abnormally after "non-accidental head trauma."
- Fractures in the ribs near the spine (posterior rib fractures) are from child abuse.
- Multiple fractures in varying stages of healing are from child abuse.
- We believe when perpetrators "confess" to committing child abuse, but we don't believe them when they deny it.
- Child abuse science is "settled" science and competent to put people in jail for many, many years.

The dogma never significantly changes over time — the terminology and manner of speaking simply changes, allowing the ideas to become more persuasive to a jury.

One example from the pediatric literature is an article on short-distance falls, entitled "Annual Risk of Death Resulting From Short Falls Among Young Children: Less Than 1 in 1 Million" (*Pediatrics* 121(6):1213-1224, 2008). According to the Abstract, "The objective of the work was to develop an estimate of the risk of death resulting from short falls of <1.5 m in vertical height, affecting infants and young children between birth and the fifth birthday."

Consider the Methods portion of the abstract: "A review of published materials, including 5 book chapters, 2 medical society statements, 7 major literature reviews, 3 public injury databases, and 177 *peer-reviewed, published articles* indexed in the National Library of Medicine, was performed."

Wow. This is a veritable treasure trove of precious information.

According to the Results, "The California Epidemiology and Prevention for Injury Control Branch injury database yielded 6 *possible fall-related fatalities of young children in a population of 2.5 million young children over a 5-year period*. The other databases and the literature review produced no data that would indicate a higher short-fall mortality rate [Remember the *ad ignorantiam* fallacy from the last email?]. Most publications that discuss the risk of death resulting from short falls say that such deaths are rare [Amen, brother!]. No deaths resulting from falls have been reliably reported from day care centers."

Now the Conclusions: "The best current estimate of the mortality rate for short falls affecting infants and young children is <0.48 deaths per 1 million young children per year." They further state, "Additional research is suggested."

Since short-fall fatalities are rare to almost non-existent, the child in your case could not have died from a short fall.

Right?

Ladies and gentleman, let me introduce to you the **Prosecutor's Fallacy**, where statistics are artfully applied to fool juries and other unsuspecting chumps.

Notice the title of the article: "Annual *Risk of Death Resulting From Short Falls* Among Young Children: Less Than 1 in 1 Million." The unwary reader is tricked into thinking that the risk of children dying from a short fall is 1 in a million, or extremely rare. In actuality, "risk" is measured with a relative risk ratio, which is a comparison of children who die from short falls with children who do not die from short falls. If one child who dies from a short fall is compared with 10 children who do not die from short falls, for example, then the risk is one in 10 (we don't know what the relative risk for short falls is in actuality).

But the authors switch the definition of risk in the article to a measurement of the annual mortality rate for short falls for *all children in California*: <0.48 deaths per 1 million young children per year. This is not a risk of "less than 1 in 1 million" but it is made to look like that in the article. Switching the definition of "risk" to "mortality rate" was the trick: This fallacy of definition-switching in the middle of an argument is known as *equivocation*. The mortality rate using all children in California is not relevant in a court case when the issue is what happened to the particular child in question who suffered a short fall.

This is blatant falsehood made to sound scientific. Stupid peers reviewing stupid studies lead to stupid peer-reviewed studies.

Before we go on with the literature, there is something we should all learn from the man who repairs our cable TV systems. Keep reading...



What We Can Learn From the Cable Guy

Image courtesy of iStockphoto.com, Joe_Potato.

Several weeks ago, my cable television system began acting up. The signal would go in and out. When I walked by the television and cable box, the image would chatter. I rebooted the system several times and I eliminated programs from my DVR, but there was no improvement.

I had to call the cable guy.

He came to my home with a device on his belt that would measure the signals coming across each cable line segment. First he checked the signal from the outside, and he found the signal to be full and complete along all wavelengths.

Then, one by one, he checked the signal coming across the various cables in the house.

One of the lines coming up from the crawl space below the family room to the cable box in the family room displayed an abnormal signal. He went into the crawl space and found about 4 partial cut-like defects in the line. Defects like these are sufficient to explain all the problems with the TV function, including the image chattering when I walked by. After replacing that line segment, he tested the signal with his device and found that the signal was once again optimal. My cable TV has worked ever since that time.

When he showed me the damaged line, I — in the typical perverse fashion that you, dear reader, have come to discover in me — asked the cable guy a question:

What do you think caused the defects in the cable?

The cable guy now entered new territory. He didn't pull out the device on his belt because it would not answer that question. All he could do was stroke his chin and guess.

"Did you do any remodeling work in your family room? I often see defects in cables after work like this is done in a house."

I admitted that we had removed the carpets throughout the house and we restored the hardwood floors. "Maybe the line got pulled up from the crawl space in the process of the restoration," he further opined. "It is hard to know for sure."

I mentioned that we had numerous squirrels in the area. Could these defects be from squirrel activity?

He said he didn't think so because the defects looked too sharp and they didn't look gnawed on. "Are you sure?" I asked him. He said he wasn't sure.

Do you see my point? If you do, then you see something that health care providers who "diagnose" child abuse and other past events do not understand: One cannot diagnose past events.

A diagnosis is what one does to find out why something is not functioning appropriately. It is a "trial and error" process that frequently follows an algorithm or decision tree. "Let's try this" or "Let's try that." "Is it working now?" "If A works, then B or C may be the problem." It is the kind of process used in computer programming. We use an observation, a device or an instrument to test a decision for each branch of the algorithm; then, further along the algorithm we go. We often "rule things out" from a list of possibilities — a "differential diagnosis" — before we finally figure out the source of the problem. The confirmation of the diagnosis is if the treatment solves the problem.

Diagnosis doesn't work with trying to figure out "what happened" or "who is responsible for what happened." We can't pull out a device or an instrument — a CT scanner, an MRI scanner, an electroencephalogram, a laboratory test — to measure abnormal structure and function in the present and figure that it will tell us what happened in the past. The past events are no longer available for observing or for testing with a device or instrument.

The only way we would know for certain how the cable got damaged is if we (or someone) witnessed what happened to damage the cable. From that, we could determine who or what was responsible for what happened, particularly if the witness account adequately explains the damage. Otherwise, we have no recourse but to imagine theories that might explain what happened — theories that may or may not be true (and are not likely to be true).

Without witnesses, we will not ever know what happened — unless there is only one plausible explanation. Even if we think there is only one plausible explanation, we might be mistaken about that.

Hence, the Inferential Test. Do you get it?

This brings me to my next point: Not all healthcare providers believe in the dogma of the Most Holy Church of Child Abuse. There are a few "nonbelievers" out there. Almost all of these deniers belong to a small company — the "Let's Be Scientific and Use Evidence-Based Medicine and Science to Come Up With a Differential Diagnosis" company.

We will see how well they fare in the next email — although I already sense that you can see where this is going.



Fighting Fire With Fire

Image courtesy of iStockphoto.com, Pgium.

Does it ever make sense to fight fire with fire?

At times, it does. During a raging forest fire, foresters may perform back burning along a fire break so that potential fuel for the forest fire is

diminished. The hope is that the raging fire will be contained by such efforts.

Unfortunately, under the right conditions, the raging forest fire will leap over the burned areas and continue burning out of control.

In the last email, I discussed the "non-believers" of child abuse. I characterized them as the "Let's Be Scientific and Use Evidence-Based Medicine and Science to Come Up With a Differential Diagnosis" group. They engage child abuse advocates through Letters to the Editor of major professional publications, pointing out alternate diagnoses for child abuse. They hold meetings from time to time, and they discuss child abuse issues through emails to a LISTSERV. Members of the EBMS (Evidence-Based Medicine and Science) LISTSERV span the globe. Many of you attorneys receiving these emails may have used some of these physicians and scientists as expert witnesses.

I am a member of this group, but these days I try to contribute as little as possible to their discussions. Much of what I write infuriates several of the members. The medical paradigm of diagnosis and treatment is deeply entrenched in their thinking, and they consider no other way as viable.

As mentioned in the previous email, diagnosis does not and cannot pertain to the analysis of past events. A diagnosis is essentially a theory capable of being tested through trial and error. Since past events are not accessible for testing, then a diagnosis of a past event is not a diagnosis at all but an untested theory — what scientists like to call a "hypothesis."

Since hypotheses are educated guesses about past events, these learned people make the very same mistake as the child abuse advocates — they surmise past events from physical evidence (Affirming the Consequent for Complex Past Events or ACCPE). This means that their hypotheses are highly likely to be wrong.

Science is essentially trial and error — continuing to guess while hoping to stumble upon the best answer. It took Thomas Edison numerous trials with various materials before he came up with the best filament for the electric light bulb, so why do these scientists believe that science will lead them to the best answer in a single past event case?

Of course, several of these give a nod to the "patient history" — the account of signs and symptoms given by a patient during a medical workup — but they de-emphasize the importance of witness accounts. Most medical doctors are not accustomed to poring over verbatim witness accounts documented by police investigators, nor are they interested in hearing what the defendant had to say to a 911 operator or to the police shortly after a tragic event. They prefer to pore over a medical record with imaging and laboratory tests or over autopsy results. They believe it is legitimate to hypothesize — to surmise the past events from the physical evidence. They do this constantly on the LISTSERV.

When these doctors analyze cases and testify, they fight fire with fire. They may help the defense by demonstrating that other explanations exist for the physical findings in a child, but often their theories do not come across to a jury as plausible. They also do not fit all available witness and physical evidence.

Consider what happened to Jennian Geddes, the brain pathologist from the United Kingdom I discussed previously, who found that hypoxia and ischemia from natural disease is associated with thin subdural hemorrhages in infants and small children. She proposed a "unified hypothesis" in her paper, "Dural haemorrhage in non-traumatic infant deaths: does it explain the bleeding in 'shaken baby syndrome'? (*Neuropathology and Applied Neurobiology* 29:14-22, 2003) explaining that violent shaking in the Shaken Baby Syndrome causes babies to stop

breathing from a brainstem injury, leading to hypoxia and ischemia, which then leads to the "triad" of subarachnoid/subdural hemorrhages, brain swelling, and retinal (back of the eye) hemorrhages.

Big mistake. Consider what was written in a press release from the Crown Prosecution Service in 2005 involving four appeals for Shaken Baby Syndrome Issues:

"Dr. Geddes gave evidence in court herself. She admitted she did not think she had the hypothesis quite right, that it was never intended to be put before a court, that she was sorry the hypothesis had been presented as fact in other court cases and that she was unhappy to think cases might be thrown out on the basis that her hypothesis was fact."

Scientific experts of any stripe will paint themselves into a corner when proposing hypotheses for past events. Every case is different, and the issues are complex. There is much we do not know about the human organism and how it functions — particularly the developing human organism. Scientific hypotheses for past events in any case are highly likely to be wrong.

If only scientists would admit their limitations. If only scientists understood the Inferential Test.

Attorneys, please hear me carefully: Do not invent your own theories for what happened as you defend your clients. You are setting yourself up for problems when those theories do not fit the evidence. You should instead understand the Inferential Test and avoid "surmising past events from physical evidence." Beat up, instead, on the prosecution's case when their theory gets it wrong!

We will talk further about the war between the "believers" and the "non-believers" in the next email.

Science and Sophistry

There is much at stake in the war between the "believers" and the "non-believers" — between the child abuse advocates and the child abuse "deniers."

No, I am not talking about the defendant — that chump who happened to be in the wrong place at the wrong time doing potentially the wrong thing. So what if he loses his freedom? I am talking about the vaunted self-importance and egos of very powerful and influential people. I am talking about scientists with great reputations among other scientists, who gather together at cocktail parties to bask in their mutual accomplishments, who believe in *quid pro quo* ("You scratch my back, and I'll scratch yours").

I am talking about funding from government agencies — the oil that keeps the child abuse machine running and lubricated. I am talking about the livelihoods of people who are believed and trusted. There is much at stake, and nothing should be allowed to get in the way — not even that chump of a defendant.

You can understand why it is important for any scientific study that threatens the "way of life" of any of these important people to be trashed convincingly and resoundingly — even if it requires a little sophistry (sophistry means, "The use of fallacious arguments," according to my computer dictionary, "especially with the intention of deceiving").

Back in 2005, injury biomechanician Faris Bandak published a paper, entitled "Shaken baby syndrome: A biomechanics analysis of injury mechanisms" (*Forensic Science International* 151: 71-79, 2005). By all rights, it should have been the death knell for the Shaken Baby Syndrome (SBS). Using a biomechanical argument and relying on previous animal and cadaver studies performed decades earlier, Bandak demonstrated that in order for an infant to develop a subdural hematoma from shaking, forces would be required that would far exceed the capability of the infant neck to withstand them. In other words, shaking a baby to cause hemorrhage in the head would cause the neck to snap in two.

This is not hard to figure out. Animals in the wild frequently will grab their prey by the head and shake it, breaking the neck. The human infant has poor neck support for a relatively heavy head, requiring people who hold infants to support the head carefully; yet none of the reported cases of SBS have significant neck injuries. Still, the notion of SBS developed to such an extent that Bandak felt he had to falsify it by publishing this article.

Shortly after the article came out, two Letters to the Editor from two different places were published in the same journal. One entitled, "Shaken baby syndrome: A flawed biomechanical analysis," had 9 authors: 6 biomechanicians and 3 doctors from a children's hospital. The other letter had two authors, both biomechanicians from another city. Both letters made the same claim and displayed essentially the same calculations.

"We are gravely concerned that the conclusions reached by Bandak may be invalid due to apparent numerical errors in his estimation of forces experienced in an infant neck during vigorous shaking," claimed the first letter. "More specifically, we have repeated the author's calculations and we find values of neck forces that are actually more than 10 times lower than those presented in Bandak's Table 3."

According to the second letter, "It is unclear how the head velocities listed in Table 2 were calculated. The free head velocity during shaking is indicated to be 4.31 m/s which perhaps corresponds to the 15 kph figure assigned to Shaking in column 1 of Table 2. Could the author please explain how this 15 kph value was calculated. It will also be interesting to know how this velocity relates to the angular accelerations [5000-15,000 rad/sec squared] and angular velocities [50-150 rad/s] which presumably were used to calculate the values of neck distraction forces in Table 3." The wording in the rest of the letter is similarly obscure but the implications are the same as the first letter, namely:

- Bandak screwed up -- he made "numerical errors."
- Since Bandak screwed up, the Shaken Baby Syndrome is true after all.

Right?

The letters represent a sophisticated misrepresentation of Bandak's argument -- a **straw man fallacy**. With a straw man fallacy, attacking a misrepresentation of your opponent's position is the same thing as attacking his position.

Bandak, in his reply, pointed out that both sets of authors made calculations from assumptions that differed from his. Both sets of authors used numbers from dummy shaking experiments -- essentially how fast can a person shake a dummy. Bandak instead used numbers from primate experiments where the heads of monkeys were accelerated so quickly that they developed subdural hematomas. In these experiments, "...the head of a primate was potted in a metal cylinder constrained for acceleration/deceleration along a prescribed arc in a prescribed time frame." Having the animal's head potted in such a fashion protected the animal's neck.

The numbers from the dummy shaking experiments would, of course, be lower because people can't shake dummies that quickly. On the other hand, the levels required to tear veins in the

head are so high that a human can't possibly attain those accelerations through shaking. Our shoulder joints and elbows couldn't withstand what it would take to shake anything that fast and hard.

Most people are not sophisticated enough to understand all the physics and math. This is particularly true of pediatricians and forensic pathologists. Still, it doesn't take a math wizard to figure out what went wrong if one knows the Inferential Test: Theories proposed by scientists and prosecutors for past events will be wrong every time they are proposed.

The next series of emails will take us into the courtroom, where battles are waged nonstop.



Presidential Elections and the Courtroom

Image courtesy of iStockphoto.com, jgroup.

All of the emails previous to this one have been prelude. Now we will apply theory to practice as we consider how to implement the Inferential Test in the courtroom.

Many of you shrug your shoulders as you explain to me that court cases are not about justice. I read you loud and clear on that one. Court cases are supposed to be about justice, but often justice is not done. Why is that?

Why is it -- in spite of so many "rules of evidence," so much case law and so much careful deliberative activity -- that the courts often fail in their important task?

Well, let's consider a venue where there are no "rules of evidence" or "case law." Let's talk about presidential elections.

Presidential elections are hard to endure. The election season is often referred to as the "silly season" because every form of negative and biased argument is on full display. Although the task at hand is to select the person best able to lead the country as a chief executive and commander-in-chief, many other issues are brought up that are intended to distract the voting public and to confirm bias.

In spite of all the rules and procedures, courts are often guilty of the same thing. If I were to use a child abuse case as an analogy, comparing it to our most recent presidential election (at least at the time I write this email), then President Barack Obama would be the prosecution and Governor Mitt Romney would be the defense. The jury would be the American voters. And I — your humble servant, Dr. Thomas Young — would be George W. Bush.

Using the O. J. Simpson trial as an analogy, prosecutor Marsha Clark would be Governor Romney, defense attorney Johnny Cochran would be President Obama, and Detective Mark Fuhrman would be George W. Bush.

I know that seems odd, but please allow me to explain.

The O. J. Simpson represents a strong circumstantial evidence case ("strong" means likely to be true) because the total evidence was overwhelming despite the crime not being directly witnessed. Child abuse cases are typically weak circumstantial evidence cases ("weak" means likely to be not true) because the events in question are typically witnessed by parents or caretakers but the state chooses its own theory over witness accounts. We now know how well that works.

In spite of the case against O. J. Simpson being strong and the cases against parents and caretakers being weak, the prosecution lost the O. J. Simpson case and defendants typically lose in child abuse cases. The reason why is not because of the nature of the evidence; the reason is because of the artful use of **fallacies of relevance** to confirm bias.

Fallacies of relevance distract the voters or the jury by focusing their attention on issues that have little or nothing to do with relevant facts. The *straw man fallacy* mentioned in the previous email is an example of a fallacy of relevance. *Ad hominem* arguments (personal attacks) are also popular, so are *red herring fallacies* (drawing conclusions that seem to be connected but are actually disconnected from the premises of an argument -- "If the glove don't fit, you gotta acquit"). Both sides in the presidential election used these fallacies in one form or another, but the most artful user won the election.

During his first term, President Obama presided over a poorly performing economy that had many people out of work. By all rights, if the United States had been a business or even an NFL franchise like the Kansas City Chiefs, he would have been fired and replaced. I believe the president was fully aware of this. Rather than defending his record, he chose instead to change the subject to something irrelevant.

One of the favorite ways for a politician to change the subject is to blame other people. Politicians like to appoint villains to blame. Ordinarily, it would be considered bad for a manager to blame others for poor performance, but it is standard operating procedure for politicians.

The president frequently invoked the "failed policies of George W. Bush and the Republican Party" as the reasons for poor economic performance. Bush was no longer president, but he was blamed for the current economic slump. Governor Romney was also blamed for a woman's death from lung cancer thanks to Bain Capital, the "greedy capitalist" outfit previously led by Romney. The family dog in a carrier on top of the Romney car, Romney's previous involvement with "Romneycare" in Massachusetts, funding for contraceptives, Romney's comments about the "47%" that he did not believe would vote for him, and "binders filled with women" were all made issues, even though these had nothing to do with President Obama's performance during the past four years or the potential of Governor Romney to lead the country for the next four.

Governor Romney seemed reluctant to respond to these seemingly wild attacks. Perhaps, it seemed "unpresidential" or "unseemly" for him to do so. Perhaps he did not want to lower himself in the eyes of the voting public — although he seemed perfectly happy to trash his opponents in the Republican primary. The attacks went unanswered, and the majority of the voting public, in my opinion, factored the irrelevant accusations into their decision. Although the Democratic party lost in a landslide during the Congressional elections of 2010, President Obama won re-election in 2012 — in spite of worsened conditions since 2010. He outwitted his opponent in spite of the relevant facts.

President Obama won with the help of George W. Bush, O. J. Simpson won with the help of Mark Fuhrman — the "evidence-planting, racist" detective — and prosecutors often win child abuse cases with the help of Thomas W. Young, MD, your humble servant. Although much

money is paid for my travel and appearance in court as an expert witness, the prosecutor can take away your "sword" and use me to stab you and the defendant. I will explain how this is done — and what you can do about it — in the next email.



“This Is Your Life”

When I am cross-examined these days by prosecutors, it seems like a rerun of a really, really bad episode of "This Is Your Life."

Prosecutors typically comb through newspaper articles and through previous cases where I have testified, looking for ways to impeach my testimony and to limit the damage that may have been done to their case on direct examination. Although their questions often involve fallacies of relevance, these fallacies are typically allowed by the court as reasonable issues for the jury to consider.

Ad hominem arguments (arguments against the person) are classical fallacies of relevance, and they come in many forms. **Abusive ad hominem** is an attack on the person's character and reputation -- both blatant and subtle (eg. "Dr. Young, how much are you being paid for your testimony in court today?"). **Circumstantial ad hominem** is an attack on a person's limitations due to his or her circumstances (eg. "Dr. Young, you are not a board-certified pediatrician, are you?" "Dr. Young, you did not personally perform the autopsy, did you?"). Using the past choices of an expert to deflect attention from the present case — with the implication that an expert is a "hypocrite" — is **ad hominem tu quoque** (Dr. Young, you determined that Shaken Baby Syndrome was the cause of death in *State of Missouri vs. Willis*, yes?). In my situation, abusive *ad hominem* is often combined with a misrepresentation of the facts (a "straw man"): "Dr. Young, you were asked to leave your position as medical examiner back in 2006, weren't you?" "Dr. Young, seven Kansas City area prosecutors wrote a letter asking you to resign, didn't they?"

Typically, defense attorneys in this situation behave like Mitt Romney: They allow these irrelevant arguments to go unanswered. They allow this line of questioning without objections to relevance, figuring that Dr. Young is handling the questions just fine. They don't want to appear "mean spirited" in front of the judge or jury. They want to play "prevent defense" and quit while they believe they are ahead.

Well, counselor, I have a news flash for you: It doesn't matter how well Dr. Young is doing with these questions — if they are allowed to happen unopposed by you, you will lose! I have seen this happen too many times to believe otherwise.

Here are my suggestions for combating this:

First, before I even take the stand, make a motion outside of the hearing of the jury for the court to exclude all personal questions against Dr. Young on the grounds that they are not relevant to the facts of the case. The judge will likely turn you down because often judges do not understand logic.

Then — when the cross-examination takes place — object in court in the hearing of the jury to every personal question — even questions having to do with how much I am paid — on the grounds of relevance. It may anger the judge but it is necessary. It tips off the jury that they are being systematically tricked.

When the opportunity comes for you to question on re-direct examination, you need to make your re-direct every bit as lengthy — if not more lengthy — than the cross-examination. You need to write down every single *ad hominem* attack and address it directly, also taking the opportunity to remind the jury of the facts that *are* relevant to the case. Consider this line of questioning, for example:

- Dr. Young, does your hourly rate have anything to do with the fact that my client saw his baby stop breathing?
- Does your hourly rate have anything to do with the fact that my client performed CPR on the child until the child had breathing and a heartbeat?
- And doctor, even if you were paid \$3,000 per hour rather than \$300 per hour, what would that have to do with the fact that a lack of blood flow and oxygen can damage the brain and the body's blood clotting system?
- And what would your hourly rate have to do with the fact that such damage can lead to subdural hemorrhages, brain swelling and damage, retinal hemorrhages, and easy bruising from simple handling of the child in the hospital?
- And even if you were paid \$3.00 per hour for your testimony, what would that have to do with the fact that what my client said happened perfectly explains what eventually happened, making what my client said likely to be true?
- What does the money and the time you put in on this case have to do with the prosecutor's weak theory of Shaken Baby Syndrome?

After that, continue with the above using my not being a pediatrician or not seeing the autopsy (I didn't run the CT scanner or make the hospital bed either!), with *MO v. Willis*, or with any other case or situation that was brought up on cross-examination. You could even make the point by inserting that I could be good or evil — an angel of light or the devil incarnate — but it still would have nothing to do with the facts of this case.

The judge won't like this. He will say you are repetitive and you are wasting the court's time. You can then remind the judge that he could have saved much time if he had excluded the irrelevant questions in the first place. You can also say that the bias from irrelevant questioning allowed by the judge needs to be thoroughly repaired, and the judge is obligated to allow it.

No fallacious argument should go unanswered; otherwise, you will lose. You need to take back the sword stolen from you by the prosecutor.

Did you like what I just did? Well, you ain't seen nothin' yet. I have more to say that could help you in the courtroom. Keep reading...



The Knockout Punch

Image courtesy of iStockphoto.com, markos86.

As it is in boxing, so it is with court cases — a knockout or "Sunday" punch at the beginning of a contest is a great way to end a dispute.

What if you were to use the Inferential Test (IT) to destroy the case against your client before that case even darkened the courthouse door? How

would you do this?

When I composed the IT several years ago, I was searching for a personal answer to a professional question: How can I know when I really know, and how can I know when I don't know? I did not realize years ago that I discovered in the IT a **necessary truth** — something that *has to be true*.

I present proofs for the IT in my article "The Inferential Test is Always True. Think of it as a Law," published on my website. If you look carefully at both proofs that use statement and predicate logic, you will notice that I make three assumptions — labeled as "Assume (for Conditional Proof)." The three assumptions are:

- That antecedent actions or conditions lead to consequences ($P \rightarrow Q$, line 1),
- That it is possible for humans to be certain — to know for sure (C, line 6), and
- That it is possible in some cases for humans to determine a single ("if and only if") explanation for consequences without learning all the antecedent actions or conditions (circumstantial or pathognomonic evidence: $Q \leftrightarrow P$, line 11).

Are these assumptions warranted? Well, if they are not, we need to close all courthouses. We need to destroy all records of case law. There can be no forensic science or — for that matter — any science that is useful or productive. There can be no system of justice. In fact, civil societies throughout the globe could not exist — people could not live together peacefully — if these assumptions are not warranted. Our concepts of truth and justice are based on these assumptions.

The IT is the necessary truth that follows from these assumptions. We all need it — not just me but everybody.

Law enforcement officers need it. If the IT were understood, the Reid technique — where suspects are interrogated for the purpose of obtaining confessions — would have to be greatly modified. If the IT were understood by the police, they would then make every possible attempt to obtain witness accounts free of coercion and to compare them to physical evidence using factual science rather than trying to get suspects to agree with a law enforcement theory. The police would use theories at the outset of an investigation as "hypotheses," but knowledgeable detectives would not settle on hypotheses without the fingerprint-like testing obtained through the comparison of witness accounts with physical evidence. The IT would revolutionize law enforcement.

Prosecutors need it. They would recognize right away when child abuse pediatricians, coroner's pathologists, and medical examiners were giving them incorrect information. They would have a rational way of comparing witness accounts to physical evidence, and they would stop creating theories for past events. They could also dispense with having to rely on fallacious argumentation to prove their cases because their cases would be sound.

Judges need it. Judges are supposed to be the "gatekeepers" of evidence — allowing appropriate evidence and excluding inappropriate evidence — but up to this point, they have been reluctant to exercise that function. A thorough knowledge of the IT and the logical principles underlying it would enable the judge skillfully to exercise the gatekeeper function — even without thorough knowledge of a specific field of science.

And scientists need it. Do they ever need it!

The IT would revolutionize the forensic sciences. Child abuse pediatricians would become forensic pediatricians (it is absurd to name a specialty after a preferred "diagnosis"), aiding prosecutors and law enforcement with logically sound methods, learning to read and understand

more than just the medical record. Forensic pathologists, of course, could greatly benefit — even though currently they resist these ideas. It is high time for us to quit acting like Sherlock Holmes and the stars on CSI!

And society needs it — particularly people who are accused of crimes they never committed.

Do you want to render the knockout punch? Then you need to start **now** — before you even get your next client. You need to persuade as many law enforcement officers, prosecutors, judges and scientists you know or have any influence on to sign up for these emails. You need to alert the thought leaders of your profession so that they can examine and understand the claims of the IT. You need to shine the light in as many dark places as you can as soon as possible. I would argue that we all have a moral obligation to do this.

I am trying the best that I can, but I am only one person. Please help us all by getting as many as you know to learn and understand the Inferential Test.

The knockout punch may not work right away — it takes time — so what do you do in the meantime? You learn to "feint and jab" — considered in the next email.

Feint and Jab

The following is practical advice for how to use the IT in court, just as you would use your fists in a fight. Like the image above, the gloves are removed. It's bare-knuckle time!

Let's assume that your client's case has made it past the preliminary or probable cause hearing and that it is now bound over for trial. Before the trial begins, make a motion to the judge in a *Daubert* or *Frye* hearing to exclude all scientific testimony offered by the prosecutor on the grounds that it is not scientific. Demonstrate to the judge the nature of the confirmation bias — Types 1, 2 or 3 — by arguing that inventing a hypothesis and then declaring it to be true without testing it is not scientific. Hypotheses in science are tested through observation or experimentation — where scientists observe the suspected antecedent "causes" in a case to lead to the consequences, or where the consequences falsify the suspected antecedent "causes" — but the prosecution's expert has not tested his or her hypothesis in this case.

The scientist or other scientists also have never tested whether or not anyone can shake a child and then have the Shaken Baby Syndrome triad as a consequence. You can substitute any "scientific" argument made by an expert and point out the same problem — it's all the same self-confirmed garbage.

There is no need to mention the IT at this point to the judge because it is easier to prove something is false than to prove something is true. A judge who does not know or understand the IT will not be persuaded when you use it in an argument.

On the other hand, if the prosecutor calls into question "Dr. Young's theory" in a *Frye* or *Daubert* hearing, then you can argue that Dr. Young does not offer a "scientific theory" — he is simply using logic and "common sense" that humans have used since antiquity, long before modern science had ever emerged. It is not Dr. Young's theory — it is simply the truth. That truth allows us to consider witness accounts, to hear all of the facts before making decisions. We couldn't have court trials without the IT being true. If you make your arguments on the basis of logic, you will make an argument that is persuasive to anyone who is fair-minded.

But many judges are often not logical nor fair-minded, so the case is likely to be tried regardless of your motion.

For jury selection, choose jurors who have some education but not too much education: They have to be able to reason and question "authority," but you don't want people who are marinated in the biases that often develop in educational settings. For example, select nurses over doctors and scientists — nurses often have much more "common sense" than doctors and scientists. Avoid people in lines of work where there is built-in bias — for example, select firefighters over police officers. Select people who you perceive to be independent thinkers and not ones who are too susceptible to peer-pressure or groupthink.

For opening argument, have a large placard printed with the IT, word for word. Explain the IT to the jury. Point out how the State in this case and the scientists they depend on are doing something that is not reliable, yet they are asking "you, ladies and gentlemen of the jury" to accept what they have unreliably concluded as the truth. Feel free to use illustrations *like* Doug's Toyota Highlander (avoid using that specific illustration because it has now been published and the answer exposed) to demonstrate how surmising past events from physical evidence does not work. Demonstrate how the State in this case did the same thing as in the illustration. Give a point-by-point description of the events taking place in the investigation that led to confirmation bias. Point out how later the jury will hear the defendant describe in his or her own words (yes, counselor, you need to let the defendant testify if at all possible) what really happened, and you will hear a scientist (me or someone who reasons like me) explain the science behind what really happened.

Do not bring up my name in reference to the IT. The IT speaks for itself and does not require my endorsement. The only thing my endorsement does is weaken it in the minds of the jurors.

For cross-examination of the State's witnesses, it is imperative that you know and understand the IT backwards and forwards (pun intended). Memorize the IT. At the outset, lay a foundation through your questions that the expert "surmised past events from physical evidence" by focusing on the autopsy or other physical evidence solely. Demonstrate how little the expert knew about eyewitness accounts at the time his opinion was made.

Often, forensic pathologists give you a gift through their autopsy reports. They may issue a preliminary report with an opinion rendered long before a witness investigation was complete. They will often give a history of what happened in the report. If the history is inaccurate in any way, point that out and ask if the facts alter his opinion. It doesn't matter if the scientist agrees with you or not because the jury (*if they understand the IT*) will see that the expert has painted himself into a corner by disagreeing with you.

After you have laid a foundation, show the expert the placard and ask her if she agrees with the IT. Let her try to explain how it is incorrect if she can. If she cites her "experience," *demonstrate* to the jury that her "experience" is nothing more than repeated confirmation bias. I said demonstrate because simply calling it "confirmation bias" is not enough — the illogic needs to be exposed by showing how she uses case after case to confirm her "beliefs."

When it is time to present your evidence, present it through demonstrating how the eyewitness accounts, particularly the defendant's account, match the physical evidence. You need to have the defendant testify, if at all possible. Simply encourage him to tell the truth humbly and calmly and to not add to or subtract from the truth. If the prosecutor tries to attack the defendant on cross-examination, make the same objections about those attacks in the same fashion as I previously described for myself (see "This Is Your Life").

What if the judge does not allow you to mention the IT? What if the defendant can't testify? And what if it is not clear what really happened (the defendant may actually be guilty but he doesn't want to talk). You can still use the IT to "bob and weave." Find out how in the next email.

Bob and Weave

I imagine by now many of you are having second thoughts.

"Dr. Young," I can almost hear you say, "You don't know what it is like to practice law before the judges in this jurisdiction. In fact, you have never practiced law, and you don't know what you are talking about. It is not that easy. I don't have a case-law-making-type of judge. I have a professional reputation to uphold and a client to defend. This is not the time to go off on these untested schemes of yours. If I bring up the IT, I will be shot at and I think I will lose."

Okay, counselor. Fair enough. Point well taken.

But I still have good news for you.

The IT is always true, all of the time, under all circumstances, and for all people. Consequently, whether you are fearless or fearful, careless or careful, offensive or defensive, you can be successful using the IT — either explicitly or implicitly. If you choose only to bob and weave by not bringing up the IT, you can bob and weave better than anyone has ever bobbed and weaved if you understand it.

I also understand that your client may have provided you with an account that doesn't make sense with the physical evidence. There may be items of potential testimony that you may not want to bring up in court because it may hurt your client. Your client also may not be stable or believable enough to testify.

Don't worry, counselor. I can work with you any way you want to try your case.

As I explain how you can argue your case without explicit mention of the IT, please consider this review:

- **How you can know that you know:** *One can be reasonably certain if witness accounts of the past are consistent or not consistent with physical evidence in the present...*

With the help of a scientist, it is possible for you to know if your client is telling you the truth or not. Your evaluation of your client and what he does or does not say will help you fashion his defense. Also, you will have a sense of what is relevant or not relevant, what is potentially helpful or not helpful to that defense.

- **How your opponent cannot know what she thinks she knows:** *...but one cannot reliably surmise past events from physical evidence...*

With or without the help of a scientist, it is possible for you to know that opposing counsel and her experts have gotten the wrong answer. You can demonstrate their error simply by bringing up the facts every opportunity you can. By the "facts" I mean witness accounts and physical evidence items that are not disputed but can serve to falsify your opponent's theory. Theories invented by attorneys and scientists often do not hold up when compared to the facts, yet past-event-surmising scientists and attorneys do not focus sufficiently to compare witness accounts

to physical evidence. This is why they fail to understand at the outset why their theories are wrong.

- **How you or your opponent may or may not know, depending on the circumstances:**...*unless there is only one plausible explanation for that evidence.*

This final phrase of the IT is a legitimate means of affirming the consequent — of reasoning backwards from physical evidence to a single event. If the physical evidence has numerous data points (fingerprint, DNA analysis, OJ Simpson case) and is interpreted while considering all available evidence, then the explanation is highly likely to be true, even to the point that it is the only plausible explanation. If the physical evidence has relatively few data points, such as a typical child abuse case, then the explanation is not likely to be true. The way to demonstrate that the explanation is not likely to be true is to offer another plausible explanation (which is easy to do if the data points are few). There are now two plausible explanations, decreasing the probability of either to 0.5 (fifty-fifty). It could be argued before a jury that "fifty-fifty" is not probable, any more than getting heads after flipping a coin is more probable than getting tails.

If the expert still argues that one explanation is more plausible than the other because of his "experience," then point out that such "experience" is his determining the same thing over and over because he thinks it is more plausible (a circular argument fallacy).

Even seemingly "pathognomonic" evidence offered by a forensic pathologist can be argued in the same way. Under the right circumstances, what looks like a gunshot wound to the head could represent a blow from the spiked heel of a woman's shoe — both look similar to one another.

Understanding the IT can provide fertile ground for the imagination and for an effective defense, even if the IT is never mentioned in court.

I am about done for now with all I have to say. We will wrap things up in the next email.

Where To From Here?

Thank you for taking time from your busy schedule to read these emails. If you have made it to this point, you have spent considerable time and effort. I hope all that time and effort pays off for you.

This is not the end but only the beginning. There is more I could say, but I am finishing this series for now. This does not mean I will not send another email. If you have questions and I believe the questions could help others to understand the concepts even better, then I will write more emails.

In the meantime, how can you learn more about forensic inference and the IT?

You can learn it from my website. Try going through the articles of the Forensic Inference Series one more time. What may have been hard for you to understand may now be easier.

Also, I provide examples of ACCPE in the "Industry News" section of my website. You will note that faulty inference is widespread throughout the world and happens frequently. If you read the articles and look at my comments, you will spot the errors. If you have any questions, please email them to me.

Also, consider inviting me to present this information to your fellow attorneys as continuing education. You can use difficult cases from your jurisdiction as examples and I can go through them with you. One of the other attorneys in your organization who understands the IT can also speak about the legal issues that can arise from these specific cases.

The more you understand basic principles of statement logic and probability theory, the more effectively you can argue your cases. That is why I highly recommend that you get one of the modern college-level textbooks of logic and read it. It may help you in ways you had not imagined.

Finally, your own casework will do much to provide continuing education because you will encounter issues requiring proper inference daily. Please consider consulting your humble servant for scientific and other assistance as you analyze your cases.

Thank you once again. See you in court.

Doug Responds To “How Science Stays Stuck On Stupid”

Do you remember Doug? He was the man who was nearly killed in that 2003 Toyota Highlander.

Doug subscribes to these emails. After reading, "How Science Stays 'Stuck on Stupid,' Part 1," he sent me the following message:

"What responses are you receiving from these missives and from whom? Not involved with your field of work, it seems like there is a lot of nonsense going on!!!"

Doug, as of my writing, there are a total of 38 subscribers to these emails. There used to be 39 but one person unsubscribed. I noticed that the one who unsubscribed had not opened many of the emails. So far, there has been little response out there to what I have been writing.

Now back to the rest of you. A while back, Doug showed the picture of his smashed car to a person who guessed the right answer as to what happened. Do you know what that man did for a living?

He is a commercial truck driver. He recognized the damage pattern right away *because he has seen this happen to someone*.

Do you detect the irony in this? Doctors who spend their time in hospitals, clinics and morgues do not have the opportunity to witness any of the events that they claim knowledge of. They claim they can recognize "child abuse" but they never see anyone inflict child abuse. They do not have opportunities to see what real child abuse looks like. Neither do the ones who submit stupid studies to stupid peers.

So who are the real experts about what happened: witnesses or scientists?

Speaking of stupidity, I recently testified as a defense expert in a case where a 15-month-old toddler was discovered to have a complex skull fracture in the backside of his skull (occipital bone). He woke up fussy and sleepy from a nap, and the boyfriend of the mother noted areas

of scalp swelling and apparent bruising in the back of the head. The mother and her boyfriend took the child to the doctor where the fracture was discovered on imaging (radiographs and a CT scan). When the boyfriend was accused of inflicting head injury in the child, he claimed that he had no idea how the child received this injury.

Although there were some temporary thin fluid collections that were noted inside the skull several days and even a month after the injury (which may or may not have anything to do with the injury), the child is doing well to this day and there are no problems with the child.

A three dimensional reformatting of the CT scan showed a small, discrete, punched-in fracture in the back of the head with three irregularly linear fractures extending from it. It reminded me of what a small area of my windshield looked like a few years ago when a rapidly flying small rock struck it.

Please do not misunderstand me: I am not saying the child was struck in the back of the head with a small rock. I can only guess, just like anyone else who did not witness what happened to the child -- including the "stuck on stupid" child abuse pediatrician.

This doctor claimed that the injury had to be "child abuse" even though she could not say what happened to cause the injury. She wrote the following in an affidavit (I redacted the name of the child):

"_____ 's skull fractures are very high force injuries. The occipital bone is the thickest skull bone and the most difficult to break. _____ 's occipital bone is broken in multiple places and broken into fragments that are pushed into the brain. This would be caused by blunt force direct trauma, with likely more than one blow based on the number and locations of the breaks. This would be a significant painful event that the child would not act normal after. Therefore, if the child was normal yesterday morning, it is highly unlikely that the injuries were present then. Based on the extent and severity of this child's skull fractures, I am concerned for his safety."

On cross examination, she had to admit that the fracture fragments were not pushed into the brain -- the dural membrane prevents that from happening -- but she claimed she was using language that "laymen can understand." She also demonstrated no knowledge about the effect of surface area on a fracture: small objects can penetrate and fracture bone with relatively little force, just as it is easier to penetrate a body with the tip of a sharp knife (very small surface area) than it is with a brick (larger surface area). She also backed off of her "more than one blow" theory after hearing my testimony, although she claimed that this still had to be child abuse. She was also forced to admit that the occipital bone of a 15-month-old is only three to four millimeters thick, just like much of the rest of his skull. This is hard to deny when the child's CT scan demonstrates it.

How did she know that this injury would be a "significant painful event that the child would not act normal after"? Because when her two small children get hurt, they cry right away! It is interesting that she falls back on something she has witnessed, even though it is clear she has not witnessed much as a child abuse pediatrician about what can happen.

Of course this did not stop the stuck-on-stupid judge from remanding the boyfriend to prison for 10 years. The defense attorney told me that the judge did not appear to pay attention to closing arguments (this was a bench trial without a jury).

There are too many who are victims of stupidity. Please encourage as many as you can to sign up for these emails! Please send me your responses and questions.

We must storm the strongholds of stupidity (How is that for alliteration?).



We're Outnumbered

Image courtesy of iStockphoto.com, alexeys.

The Alamo is the only dismal failure I am aware of still celebrated by Texans.

"Child abuse" cases are typically weak circumstantial evidence cases. They are typically based on ACCPE (affirming the consequent for complex past events: "...surmising past events from

physical evidence..."). ACCPE is an invalid inference, and conclusions for what happened based on ACCPE are highly unlikely to be true.

Still, even if a defense attorney is aware of this weakness and even though the state offers incredibly weak evidence to support an incredibly weak case, the state more often than not wins these cases. Why?

It is because the scientists who support the defendant's case are outnumbered by the scientists who support the state's case.

Ever since C. Henry Kempe, the doctor who trumpeted the "Battered Child Syndrome," came up with the notion that a doctor could diagnose a past event and call it "child abuse," physicians and many others since 1962 have offered this simple diagnosis in a bewildering wide variety of cases. This diagnosis is unquestioned and supported by the vast majority of physicians everywhere.

Consequently, the argument offered in court for the state's case is an **argument of enumeration**: Something is more likely to be true if most experts in the field claim it is true.

This argument trumps all other arguments in the minds of judges and jurors. The courts eagerly want to know what the "consensus" is among such experts so that they can rule appropriately: the experts get to vote and the court accepts the decision.

Pediatricians and prosecutors understand this. In the infamous Boston *au pair* case where the court convicted Louise Woodward of involuntary manslaughter in the death of eight-month-old Matthew Eappen back in 1997, 72 physician-experts in child abuse published a letter, decrying the defendant's argument that the subdural hemorrhage in the child's head was old, occurring prior to the involvement of Ms. Woodward, and that the expansion of it was due to spontaneous rebleeding. The signers of this letter used the words "peer reviewed" and "generally accepted" to support their arguments. You can read the letter for yourself at <http://child-abuse.com/sbsletter.shtml>.

Who would dare question the judgment and conclusions of 72 experts? Certainly not a judge or a jury — people who are not nearly as "learned" as these experts!

On top of that, combine this reluctance with the ***ad misericordiam fallacy*** (appeal to pity). We all love babies and are moved by their innocence and helplessness, so someone responsible for the injury or death must be brought to justice.

With so much stacked against a defendant in a child abuse case, the defendant will likely be as successful as the embattled Texans were at the Alamo. How can one ever hope to be successful in arguing against "child abuse" when one is outnumbered?

Child abuse cases cannot be argued in the same way other cases are argued if you hope to be successful. A few emails ago, I gave concessions to attorneys who want to "bob and weave" — to defend their client without explicit mention of the Inferential Test — rather than "feint and jab" — to defend their client directly with the IT. If you want to "bob and weave" then go for it, but you will likely lose. Any logical argument will be defeated by the votes of a multitude of misguided pediatricians and pathologists.

That is why you need to go after the whole notion that a physician can diagnose child abuse like any medical condition. That is why you need to demonstrate that scientists have been duped for decades and are sending everyone on a snipe hunt. That is why — if you hope to win — that you need to defeat the whole child abuse industry on behalf of your client.

You need to go for broke, go for the jugular, "feint and jab" instead of "bob and weave."

The judge and jury need to see that all of these physicians and scientists commit an **ad verecundiam fallacy** (appeal to false authority). None of the 72 physicians has ever seen child abuse take place — they are simply guessing that any case must be child abuse without an observable or factual basis. The judge and jury need to see that offering untested hypotheses is not scientific because science is based on both observation and testing. The judge and jury need to see that the "appropriately tested scientific evidence" they claim to support in the Woodward letter signed by 72 physicians is nothing more than elaborate circular argumentation — elaborate studies that determine that something has to be because it is already accepted that it has to be.

Simply arguing small points of science in the courtroom is not going to win the day. Judges and jurors do not understand small points of science. Small points of science bore them and go over their heads. Rather than trimming the branches of the tree, the tree instead needs to be chopped down and the roots destroyed. The illogic of the Most Holy Church of Child Abuse needs to be decimated with every child abuse case if you hope to win.

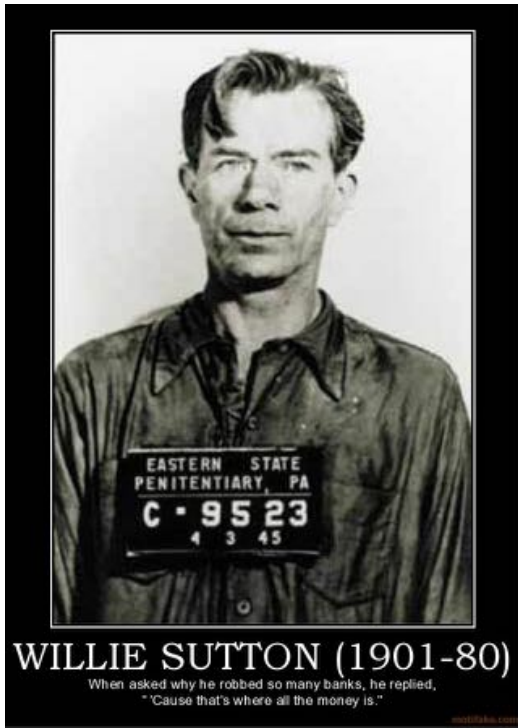
This is not for the faint of heart. Are you up to the job? Do you know what you need to do?

The outcome at the Alamo would have been different for Davy Crockett, Jim Bowie, and William Travis if they had dropped a large bomb on Santa Anna's forces. You can drop a bomb on the state's case and the multitude of experts that support it if you have the courage to use the Inferential Test directly in the courtroom.

Where The Money Is, Part 1

As a medical student and fledgling medical doctor, my teachers told me about Willie Sutton. Sutton was the notorious bank robber who, when asked by a reporter why he robbed banks, answered, "'Cause that's where all the money is."

In spite of the answer being self-evident and seemingly circular ("Why do you rob banks, Willie? 'Cause that's where all the money is. How do you know where all the money is? 'Cause it's in banks."), I imagine it was a way to encourage me to go to the right sources for right answers



about medical issues in a patient. This seemed to go along with encouragements to consider first the most simple and straightforward explanations to a diagnostic problem (Occam's Razor) and also to consider the most common problems first ("If you hear hoofbeats, think horses and not zebras.")

In spite of the wisdom from Sutton, most doctors, lawyers, investigators, and even judges do not seem to go to the right sources for the right answers when it comes to figuring out what happened. In other words, they don't know where the money is.

Well, beginning today, I'm going to "show you the money" (apologies if you don't like my cheesy references to old television shows and movies scattered throughout this email). Forget everything you heard about Occam's Razor and horse hoofbeats — the method I will demonstrate through the story below works well for discovering what happened.

Before I get to the story, I want to remind you of something I told you back in the fourth and fifth emails. It has to do with facts and beliefs.

A fact, as defined in my computer dictionary, is "the truth about events as opposed to interpretation." Facts are items that are directly observed. We have the word, evidence, because evidence is evident — capable of being observed as events by eyewitnesses (anamnestic evidence) or as items of substance by investigators and scientists (physical evidence).

Beliefs are not facts. This is clear from the computer dictionary definition above. A belief, according to the same dictionary, is "something one accepts as true and real; a firmly held opinion and conviction." Rather than being an item that is directly observed — that exists outside of the head of the observer — a belief exists inside the head as a thought, an opinion, a conviction, something accepted rather than seen. A belief is an item not directly observed that may or may not be true. A fact is capable of being observed by others (although not always uniformly interpreted by others), but a belief is an inward, individual experience (although the belief may be similar to those held by others).

Facts are more likely to be true than beliefs. Events that are observed are more reliable than the interpretations and opinions about the events. In order to know where the money is for finding the truth about what happened, facts need to be considered more than the interpretations offered by others about the facts. This is why I told my investigators — when I was a medical examiner — that I wanted to know what they saw and heard at the death scene before I learned their opinions about what they saw and heard.

Now for the story. I will list 10 items in chronological order, and you try to figure out which items have the money. This story is "inspired by true events," and "the names (even many of the facts) have been changed to protect the innocent" (Also, "no animal was harmed" in the composing of this story).

1. One spring evening shortly before dark, thirteen-year-old Jim Bob Jones telephoned 911. According to the 911 operator, the boy said Joe Jones, his father, fired shots at his mother. He said that his mother and his father were outside of the house when the shooting occurred. Jim Bob was inside the house, making the telephone call from a land line. He said that they (his mother, brother, and he) had problems with the father before the shooting,

that the father did not live there, that Jim Bob did not see the gun, that he did not know the type of gun, and that he did not know how the father who lived in town got to their property. He said he heard 5 shots and his mother yelling for him to call the police.

2. Twelve minutes later, seventeen-year-old John Boy Jones called 911 through a cell phone. According to the 911 operator, John Boy said that his mother had been shot by the shed near the house. The boy's grandmother then got on the phone and said that the grandfather found the boy's mother lying by the shed, without breathing or pulse. There was bleeding from her chest. John Boy insisted that his father shot his mother.
3. After both 911 calls, the police responding to the scene found Jane Jones to be dead. A 20-gauge single-shot break-open shotgun laid by her body and there were apparent bullet wounds (not from a shotgun) in her chest and back. A spent shot shell lay in the unopened shotgun. Four unspent shot shells, 2 nickels, and 4 pennies were in her pockets.
4. One hour after the earliest 911 call, John Boy spoke to the police. He said that his brother, mother and he drove home from town. Upon arriving, he heard a shot fired but he wasn't clear where it came from. His mother went into the house and grabbed his brother's shotgun, then she walked toward the shed. Meanwhile, John Boy had an errand to run, so he drove the car to grandmother's and grandfather's house nearby. When he drove into the driveway of that house, he heard three or four more shots. Since people fire off guns frequently where he lives, he did not think much of it and went inside the house. Other neighbors telephoned the house to express worry about the shots that they heard. Upon returning to investigate, John Boy and his grandparents found the body of his mother near the shed. John Boy brought his pocket knife so that he could stab his father if he encountered him.
5. Three and a half hours following the earliest 911 call, Joe Jones, the father, called a friend to tell her that he shot his wife and that he was in trouble. He thought his wife was dead.
6. One day following the earliest 911 call, Jim Bob told the police that he also heard a shot while they got out of the car (just like John Boy), but he did not know where it came from. He did not see where any bullet from that shot hit anything. He went into the house with his mother, saw her grab his shotgun, and watched her through the window as she walked toward the shed (the shed was about 50 yards away from the house). He then heard one shot, then he heard his mother tell him to call the cops and heard her say "I love you guys." He then heard the voice of his father say, "You're gonna die!" Jim Bob then heard three or four more shots — one quickly following after the other. He perceived the shadowy form of his mother falling to the ground.
7. The autopsy report disclosed two gunshot wounds — one to the side of the chest and another to the back. Two .22 caliber bullets were found at autopsy. The heart and both lungs were perforated, and there was copious blood in the chest cavities. There was no soot or gunpowder stippling around the gunshot wounds.
8. Subsequently, the police found numerous voicemail messages in the home telephone from Joe Jones, swearing at her and the two boys. There were no specific death threats. There was a restraining order already in force against the father at the time of the incident.
9. Joe Jones remained silent when speaking to the police but while in jail two months after his arrest, he wrote a letter to a friend. The letter claimed that he was only trying to defend himself. When Jane shot at him, he ran to a truck on the property, pulled out a pistol from under the seat, and shot her before she could shoot at him again. He wrote, "It was self defense, and my lawyers can prove it!"
10. According to the indictment by the state, the father lay in wait for his family to return home and fired his gun at the family. After the mother went inside the trailer to get the shotgun and after she came out, the father shot her multiple times, hitting her in the side of the chest and in the back. The prosecutor was prepared to offer numerous witnesses attesting to the hatred that Joe Jones had for his wife. "Self satisfaction" was assigned as a motive for the premeditated killing.

Where is the money? To be continued...

Where The Money Is, Part 2

Where is the money?

This is a continuation from the last email. You may want to refer to the numbered items in the story I presented in that email.

Is the money in #3 and #7 (the physical evidence)? Well...no. Not really. Physical evidence is important -- even essential (as will be seen below) — but it does not tell you entirely what happened. Millions of scenarios about what happened could be composed from physical evidence, with all scenarios "consistent with" the evidence.

Whenever a pathologist states in court that the physical evidence is "consistent with" the state's scenario or theory, the pathologist makes a meaningless statement. So what if it is consistent with the state's theory? — it is also consistent with millions of other theories that could be imagined. Stating that the physical evidence is consistent with a belief is meaningless. Stating that the physical evidence is consistent with other facts in the case? — well, that's another story!

Is the money in #10 (the state's theory)? No. Law enforcement in this case did seek out witness statements (thankfully!) but they made a basic mistake — one that is made over and over again by law enforcement investigators and prosecutors: they formed a theory in their minds, then they tried to use witness accounts to support their theory. This is confirmation bias, as we have discussed previously. It is not reliable, so don't look there for the money.

Let me tell you where I believe the money is.

I have found over the years I have been doing what I do that eyewitness statements made close to the events in question tend to match physical evidence more coherently and comprehensively than any other witness statements. Further, people rarely, if ever, lie to 911 operators!

There are several plausible explanations for why this occurs.

First, the memories are fresh and not as subject to corruption or degradation that occurs over the passage of time.

Secondly, there has not been enough time for the witnesses to consider the outcome or consequences of their statements. This is probably because the outcome or consequences are unknown at the point in time they offer their statements. Ulterior motives are difficult to form when the situation is fluid and not everything is understood by the witness.

And with 911 calls, there is frequently a crisis. It is important, then, for the caller to be as accurate as possible about what is happening because the life of someone may be at stake. I consider 911 calls to be like a modern "dying declaration" — a statement made by a person whose death is imminent that the courts allow as evidence under the hearsay rule (see http://en.wikipedia.org/wiki/Dying_declaration for further information if you are not an attorney).

The content of the 911 calls, as I recorded in my story, was interpreted and recorded by the 911 operator, but note what is said. Both John Boy and Jim Bob identified to the 911 operator that the shooter was their father. The behavior of Jane Jones strongly implies that she was aware of the same thing — she went into the trailer home to grab Jim Bob's shotgun in order to confront someone with whose behavior she was already familiar. Note that none of the three felt they

were under imminent attack. If they were, wouldn't they hunker down in the car, drive away, and call 911? Instead, John Boy runs an errand and Jane walks toward the shed with a shotgun.

The statements that Jim Bob and John Boy made to the police shortly after the event are also consistent with their 911 calls, and there are no inconsistencies. Both identify a shot fired when they got out of the car, and Jim Bob did not indicate that the bullet from the gun hit anything near them. Jim Bob and John Boy described behaviors that indicate that neither the brothers nor the mother felt they were under immediate threat. Furthermore, Jim Bob said he heard his father later shout, "You're gonna die," supporting that the boys and their mom knew they were dealing with the father.

Piecing together the eyewitness statements made shortly after the event and comparing them to the physical evidence, this is what is likely to have happened:

1. The father shot a gun to get their attention.
2. The mother encouraged her children to be somewhere else while she confronted her errant husband with a shotgun. Unlike the children, she knew where the shot came from, so she walked to the shed.
3. The spent shotgun shell in her weapon and the statement of Jim Bob indicate that the first shot was fired by her. Jim Bob heard that shot before he heard his mother yell, "Call the cops" and "I love you guys." There wouldn't be sufficient time to reload a single shot shotgun with a fresh shot shell.
4. The volley of several shots were fired by Joe Jones. His pistol did not require reloading like the shotgun. The statements of both boys made to the police imply that the shots were fired in close succession to the first shot. For instance, John Boy did not indicate any gaps in the shots he heard from nearby.

I believe that the theory above represents the "only plausible explanation," given the statements of the witnesses made shortly after the event and the physical evidence. I would not testify in court to a reasonable degree of medical certainty about this explanation because there may be explanations for the evidence I have not thought of or considered. Still, the scenario above — formed from facts and not beliefs — makes the most sense, and a defense attorney could argue this in court before a jury as the most plausible explanation, given all the facts.

Finally, consider the statement of the defendant made in his letter to a friend — item #9. By this point, the defendant is well aware of the evidence against him and that he is in serious trouble. His statements at this point would be "adjusted" in his mind, not necessarily as a "lie" but in the form, perhaps, of "wishful thinking." Note that his statement does not mention the shot fired at the outset, nor does he account for saying, "You're gonna die." His story of pulling the gun from under the seat of a nearby truck allows him to defend his actions, but it doesn't comport with the succession of gunshots described by the boys to the police.

Where is the money? It is in the statements of eyewitnesses made near the time of the event, tested by the physical evidence gathered after the event for consistency or inconsistency. For me, robbing banks like this is incredibly easy.

How about you? Do you want to rob banks? It is, after all, "where all the money is."

The Principle of Explosion

Image courtesy of iStockphoto.com, Torquetum.



Lately, I have been arguing with the folks on the EBMS-LISTSERV.

You may recall me mentioning them in the email entitled, "Fighting Fire With Fire." These are the doctors and scientists who are child abuse deniers. They counter the child abuse hypothesis in court by offering other plausible hypotheses or potential explanations for child abuse — a "differential diagnosis." Some examples of their "differential diagnoses" include, 1) chronic subdural hemorrhages in infants may be from birth trauma or other birth-related complications, 2) maternal vitamin D deficiency may lead to numerous fractures in infants without significant trauma, 3) a lack of oxygen or a lack

of blood flow to the brain for a period of time may result in thin subdural hemorrhages. I could go on and on.

I believe these items lead to the consequences described above. My disagreement with them has nothing to do with that. My disagreement with them has to do with the logic behind what they do.

Floating non-child-abuse hypotheses in the courtroom in order to stir up reasonable doubt is not a good idea. It wasn't a good idea when Dr. Geddes testified about her "unified hypothesis" for Shaken Baby Syndrome in 2005 (see "Fighting Fire With Fire" email) and it is not a good idea now. Why is this?

Consider the Principle of Explosion.

This principle of logic is expressed in Latin as *ex falso quodlibet* or *ex contradictione sequitur quodlibet* (from a contradiction, anything follows). If a contradiction — a statement that is necessarily and always false — is assumed to be true, then any conclusion can be drawn — no matter how silly — and the argument is still valid. For example:

If $1 + 1 = 3$, then pigs can fly.

This statement is not useful but it is valid logically. If $1 + 1 = 3$, then "heaven knows, anything goes!"

Here is another example (number 1):

If guessing is the same as knowledge, then retinal hemorrhages in an infant indicate child abuse.

Or (number two):

If guessing is the same as knowledge, then retinal hemorrhages in an infant do not indicate child abuse.

It doesn't matter which of these two examples you prefer: both are valid arguments, even though they are contradictory.

"Guessing is the same as knowledge" is a contradiction, of course. If you were to take a multiple choice examination in school and guess all of your answers, you would not be demonstrating knowledge. You would be demonstrating the lack of it. If the test was adequately designed, you would fail it.

The word, "hypothesis," is a fancy name for "guess." In science, hypotheses are not allowed to stand alone. They have to be tested. One way to test is to design an experiment. Another way — in the medical setting — is to order "tests": laboratory tests, imaging (x-rays, computed tomography scans, etc.), or functional tests like electrocardiograms.

There is no way to test a past event — an event that has come and gone — by experimentation or by the diagnosis/treatment trial-and-error paradigm. Past events — events that are no longer present — are not accessible to any of that type of testing. Consequently, hypotheses about past events are typically untested guesses floated by these scientists.

The Inferential Test is the only way to test for past events, but neither the EBMS people nor the child abuse proponents want to understand this; hence, what is left is to float untested hypotheses and dress them up as knowledge in the courtroom.

If scientists guess in the courtroom and call it knowledge offered "to a reasonable degree of medical certainty," then, according to the Principle of Explosion, it is legitimate for the jury to conclude child abuse or not to conclude child abuse — either one. This demonstrates how little help scientists who hypothesize or guess are in a courtroom!

There is one pathologist who looks for retinal hemorrhages at autopsy with an instrument called an ophthalmoscope, and he presents to the EBMS-LISTSERV each case where retinal hemorrhages occurred without child abuse. By doing this, he is tacitly accepting a contradiction — the contradiction that guessing is the same as knowledge. When child abuse pediatricians assume that retinal hemorrhages indicate child abuse, they are simply guessing over and over again. When the pathologist with the ophthalmoscope thinks that he is falsifying that guess, he is accepting as a premise that the guess is a legitimate conclusion from factual testing rather than a contradiction.

Consequently, it doesn't matter how many cases this pathologist presents, child abuse experts will still validly conclude that "retinal hemorrhages indicate child abuse" because of the Principle of Explosion! All they need to do is make their conclusion sound plausible to a jury ("Something other than child abuse led to retinal hemorrhages in those few cases, but child abuse leads to retinal hemorrhage in all other cases — including this case!").

Rather than try to attack with a million tiny cuts, why don't these EBMS doctors just go for the jugular? Why not instead declare that the premise of "guessing = knowledge" is a contradiction that all courts should reject immediately?

Why not use the Inferential Test to "explode" the entire child abuse industry?

The Inferential Test By The Numbers

$$(1 + 1) \rightarrow 2$$

$$\sim (2) \rightarrow \sim (1 + 1)$$

$$2 \rightarrow (1 + 1)$$

$$2 \rightarrow (1 + _)$$

I hope this email finds you well. It has been a while since you have heard anything from me about the Inferential Test (IT). I hope you remember it:

One can be reasonably certain if witness accounts of the past are consistent or not consistent with physical evidence in the present, but one cannot reliably surmise past events from physical evidence unless there is only one plausible explanation for that evidence.

I am always thinking of ways to illustrate the IT. Here is one way: a "by the numbers" approach — all based on the simple given idea that one added to one equals two.

Note the four symbolic "statements" listed above.

The arrow in each line indicates a *conditional statement*: an "If..., then..." statement. Translated into English, the first line is: If one was added to one (notice the past tense), then the sum is two (notice the present tense). The second line is: If the sum is not two, then one was not added to one. The tildes in the second line are negations: NOT 2 and NOT 1+1.

Consider that the item to the left of the arrow in the first statement — the *antecedent* in a conditional statement — symbolizes multiple past events and that the item to the right of arrow — the *consequent* in a conditional statement — symbolizes the physical evidence outcome of the past events. Notice that the two conditional statements above follow the first part of the IT: "One can be reasonably certain if witness accounts of the past are consistent or not consistent with physical evidence in the present..." The first conditional statement represents a simplified form of *modus ponens* (MP) — an ancient way of saying "the way of affirming" or "affirming the antecedent." If one plus one is true, then two as a consequence of one plus one is also true. The witness account is consistent with or sufficiently explains the physical evidence outcome. This is a valid inference because of its form.

The second statement follows from the first. A sum other than two falsifies the antecedent in the first statement. This represents a simplified form of *modus tollens* (MT) — an ancient way of saying "the way of denying" or "denying the consequent." If the consequent is not two (two is false), then one was not added to one. The physical evidence is not consistent with the antecedent witness account. This is also a valid inference because of its form. Valid inferences support a claim of "reasonable certainty."

Now, look at the third statement. That statement is not valid for certainty because many different numbers added together can lead to a sum of two. Adding 1.1 to 0.9, for example, can lead to a sum of two. The total number of possible combinations is infinite. This is why selecting the correct answer by *affirming the consequent* — the name of this famous invalid

deductive argument form — does not work. It does not work to surmise complex past events from physical evidence *unless* there is only one plausible explanation.

The fourth statement above illustrates the only plausible explanation, an inference to a single past event when all other relevant past events are known and considered (if it is even possible to know and consider all other relevant past events). The only plausible explanation in the fourth statement for the blank is "1".

Do you understand? I hope you do. What could be more simple than "1+1" and "2"?

What would be the consequences of *denying the antecedent* - of saying, "If one was NOT added to one, then the sum is NOT two"?

Wait for the next email to find out how horrible the consequences can be.



Why “Thinking Dirty” Does Not Work

The photograph to the left is of the hapless Dr. Charles Smith, a former pediatric forensic pathologist from Toronto. In this picture, he is seated before the Goudge inquiry — hearings that took place in Canada several years ago. This doctor no longer practices as a pediatric forensic pathologist; his reputation was destroyed.

For over twenty years, the sworn testimony of this consequent-affirming scientist led to the imprisonment of many parents and caretakers who were accused of abusing children. The crimes for which these parents and caretakers were accused were never witnessed, but thanks to modern science and Dr. Charles Smith, these parents and caretakers

$\sim (1 + 1) \rightarrow \sim (2)$

were sent to jail anyway. This was satisfactory for over twenty years until officials in Canada figured out that Dr. Smith was mistaken repeatedly.

During that time, the chief coroner of the province had as a policy for doctors to "think dirty." Because of concerns for the protection of children, he asked forensic doctors to presume the worst about parents and caretakers — to presume that they were liars who wanted to cover up their abusive crimes. During and even before the Goudge hearings (named after the presiding judge), government leaders changed their thinking. Doctors were no longer asked to "think dirty." They are now asked to "think truth."

The bureaucrats and the forensic pathologists serving in Ontario figured out that, perhaps, "thinking dirty" was not a good idea, but to this day they do not understand why it does not work.

The symbolic statement below Dr. Smith's photograph represents the invalid argument form of *denying the antecedent* — expressed in the "by the numbers" approach from the last email. The statement is not reliable for certainty and does not represent knowledge. Adding numbers

other than one and one may lead to an answer that is not two, but it also may lead to an answer that is 2. One example is adding 1.1 to 0.9. The combinations of numbers that have a sum of two but are not 1+1 are infinite.

Regarding past events, the mistake of *affirming the consequent for complex past events* (ACCPE) — where past events are surmised from physical evidence — represents a back-end, conclusion-based mistake. In contrast, the mistake of *denying the antecedent for complex past events* (DACPE) — presuming that witnesses are giving false statements — represents a front-end, premise-based mistake. If people are presumed to make false statements, then looking at the physical evidence will not help to discern if the statements are false or true. With such a presumption, there is no ability to learn anything or to self-correct. Self-correction is a hallmark of valid science and good law enforcement.

Modern forensic doctors and scientists are grossly ignorant regarding these mistakes. Many forensic pathologists think it is a good idea to "diagnose" child abuse (a diagnosis is a hypothesis for what is wrong with a patient), and even the forensic pathologists who hesitate to do this do not know why it is a bad idea. *Almost all child abuse pediatricians think it is proper to "diagnose" child abuse.* Even the name of *child abuse* pediatrics demonstrates a mistaken presumption of falsehood rather than truth, of guilt rather than innocence. To borrow from the lyrics of an old Pete Seeger folk song ("Where Have All The Flowers Gone): "...when will they ever learn?" Well, if they choose to presume a negative, they will never learn.

Over several years, several scientists have offered me glib criticisms of my ideas even before taking the time to understand them. They have said several things like:

- "Dr. Young, don't you realize that *witnesses lie*? Why are you so gullible?"
- "Dr. Young, don't you know that *deductive inference does not work* in forensic casework?"
- "Dr. Young, don't you understand the medical literature that shows how the *memories of witnesses are flawed* and that you *cannot rely on memories*?"

Do you see the problem?

Now, consider the situation where the infant or small child that you have been taking care of is involved in an accident at home or has become suddenly and unexpectedly unresponsive. The police are now at your door and they want to ask you questions. What is in store for you?



Confessions, Part 1

Image from The Kobal Collection

Here is a small glossary of terms and abbreviations:

MP: *modus ponens*, verifying witness accounts using evidence, valid and reliable for complex past event analysis.

MT: *modus tollens*, using evidence to falsify witness accounts, valid and reliable for complex past event analysis.

ACCPE: affirming the consequent for complex past events, "surmising past events from physical evidence," an invalid method that does not work reliably.

DACPE: denying the antecedent for complex past events, presuming witness accounts to be false, an invalid method that

does not work reliably.

I have a confession.

Since I began my full-time consultation practice in 2007, I have observed many police interviews and interrogations through video and audio recordings. While listening or watching through my computer, I frequently yell at the police officers, using words that I will not repeat to you.

These police officers use ACCPE and DACPE almost exclusively during these interrogations. I see it, but they do not see it. That is what makes me angry.

Police officers rely on the *Reid technique* (Inbau FE, Reid JE, Buckley JP, Jayne BC. Criminal Interrogation and Confessions, 4th ed. Sudbury, MA: Jones and Bartlett Publishers, 2004). This technique has developed and been in use since the 1940's. Purveyors and teachers of this technique mean well — they want to find the truth — but unfortunately, one should not expect a bad tree to yield good fruit.

The stated goal of the Reid technique is to obtain a confession of guilt. It consists of two stages. First comes the *interview*. The purpose of the interview is to gather information. It is non-accusatory, detailed, and free-flowing. Following the interview is the *interrogation*. An interrogation is accusatory, coercive, and manipulative by stated design. Police officers are instructed to use body language, flattery, aggression, exaggeration, and deception as means to obtaining that highly-prized confession. Items learned in the interview are used as weapons during the interrogation. The "carrot" and the "stick" are alternately used until, after many hours, the suspect finally confesses.

Interrogating officers use ACCPE. They develop a theory for what happened — or they use the theory offered by the forensic pathologist or the child abuse pediatrician. The officers then try to manipulate the suspect to agree with that theory. If one looks at the transcript of the interview/interrogation or watches or listens to the recording, it is often easy to see that the item to which the suspect eventually confesses was first mentioned by the officers and not by the suspect.

Interrogating officers use DACPE. If you are questioned by police officers about the items I mentioned in the previous email, expect that they consider you to be a liar and guilty. Do not try to persuade them otherwise because you will not be successful. "Lawyer up" instead.

But many do not "lawyer up." On rare occasion, I have seen some suspects resist heavily applied pressure, but most eventually give in. They tell a lie or several lies — thinking that will help their "no win" situation — and then the lies trap them. At a certain point in the interrogation, many suspects collapse — often precipitously — and offer confessions.

On the face of it, a confession is already a contradiction: If police officers consider suspects to be lying, how can they expect confessions to be truthful? The answer is that they cannot, but as long as the confession confirms their bias, it will suffice.

Is there a better way? You bet there is! But before I discuss that better way, I need to discuss investigation and ACCPE in a little more detail.

Investigators Should Affirm the Consequent (But Not in Court)

Image courtesy of iStockphoto, courtneyk.



Affirming the consequent is not always a bad thing. Actually, it is essential...during an investigation.

Consider the jigsaw puzzle. The puzzle solver selects a puzzle piece from numerous other puzzle pieces and tests it for fit in trial-and-error fashion with the pieces that are already assembled. Eventually, a picture emerges.

In a similar way, an investigator searches for facts that each have numerous possible explanations (ACCPE), but he or she does not stop there. The investigator tests each fact and each possible explanation for "fit" — consistency

or inconsistency (MP or MT) - with all the other facts in the case. Eventually, a picture of "what happened" and "who is responsible for what happened" emerges. That picture may be the "only plausible explanation" (also AC).

What if a jigsaw puzzle solver uses an Emery board to reshape puzzle pieces to fit? I do not even need to tell you how disastrous that would be to the eventual solution of the puzzle.

Scientists at one level recognize the importance of collecting physical evidence in a way that does not "contaminate" it. Pathologists also recognize the importance of careful autopsy technique to prevent introducing "contaminating" factors into an interpretation. Ideally, these doctors do not want to apply an Emery board to important and delicate physical evidence.

What is often not understood — either by scientists or by law enforcement personnel — is that witness evidence can also be "contaminated." Scientists and police officers should use the same kind of care in interviewing witnesses as they use in obtaining physical evidence.

In the next several emails, I will present logically sound methods for obtaining witness data, even obtaining a reliable "confession."

Confessions, Part 2

Now for the logically sound methods for reliable confessions.

First, consider what it must be like to conceal guilty knowledge, to hide from the police that you have committed a crime.

Concealed guilty knowledge carries with it incredible power and an incredible burden.

Knowledge is power. If someone knows something that police officers want to find out, that person can manipulate police officers and others. He or she can confuse people — leading them on wild goose chases — and can use police officers to exact revenge or punish other people.

I recall one case where a woman was found in her apartment stabbed to death. One of the male witnesses described in great detail the physical evidence that was found in the apartment (items he would not be expected to know) and how the stabbing took place. He also told the police that a lady friend of his told him how she had murdered the woman in the apartment and where she had hidden additional evidence. The police officers actually thanked this man for being so helpful, then they obtained a confession from the drug-addled lady friend who — with slurred speech — demonstrated no knowledge of any of the physical evidence or how the crime was committed. Still, she confessed to having done the crime — although in the following weeks, months and years that she sat in jail, she remained confused about what really happened.

Guilty knowledge is also a burden. Imagine what it would be like to conceal a horrendous act for the rest of your life. It would take incredible self-discipline to prevent that knowledge from creeping out of your mouth. It is also hard to keep track of the lies that are told, so what often happens is that everything that is said is truthful except for one or a few points. There is the fear of a slip-up. Also, not many are so hardened that their conscience does not bother them.

It is very difficult to prove someone is truthful, but it is very easy to demonstrate that someone is making false statements. In a similar way, it is also difficult to prove to someone that you can be trusted — this requires your repeated good behavior — but it is very easy to demonstrate to anyone that you cannot be trusted — this requires one slip, one mistake, one failure. Consequently, if police officers are patient and careful, they can uncover the guilty knowledge from a guilty person. On the other hand, if police officers force a confession from someone they presume to be guilty, they will mess up. The burden will then for the most part be lifted from the guilty person because now someone else has to accept the blame.

So how should an investigator conduct an interview? What are logically sound methods?

1. *Presume truth and innocence from all witnesses (no matter how guilty they seem).*

This eliminates the interrogation phase of the Reid technique. An interrogation is an accusation, and an accusation involves a presumption of falsehood and guilt (DACPE). During an interview, not only should one presume truth and innocence in a person but one should also do his or her level best to affirm that truth and innocence. An investigator should think of himself as that person's defense attorney. If the person is false or guilty, that is easily demonstrated by facts, but in order to gather reliable facts, the investigator should do her level best to consider the witness to be truthful and innocent, giving the witness every opportunity to correct any misstatement. Investigators have to overcome a natural inclination to jump to conclusions.

2. *Be sincerely kind.*

Unlike the Reid technique which advocates alternating insincere kindness and flattery with fear and intimidation, the logically sound technique serves to put the witness at ease. Witnesses need to see in multiple ways that they can trust the person asking the questions, that he can be fair, that she can be thoughtful, that he will not judge them prematurely and harshly without reason. Witnesses will tell an investigator more if there is trust (and such trust is not easy to build). Even guilty people will tell an investigator more if they feel comfortable — even to the point that they let their guard down.

There is more. I will continue...

Confessions, Part 3

3. *Always tell the truth.*

Police investigators typically and constantly lie to suspects, thinking this will lead to truthful responses from them. If a suspect thinks you lie (and it does not take that much to see that you are lying — particularly if the suspect knows more about what happened than you do), then why is it reasonable for you to expect the truth from a suspect. And if you are expecting the suspect to lie to you, then why are you wasting your time?

4. *Make sure the witness is sober.*

It is amazing that I even have to write this. I have often seen recordings of interviews where the witness has slurred speech and incoherent thoughts. Perhaps under the Reid technique, this would be a quicker way to get a confession — when the person interrogated cannot think clearly — but this is no way to learn the truth about what happened.

5. *Recording devices should be visible to the witness.*

We are all familiar with the one-way glass often depicted in crime dramas, where multiple police officers watch an interrogation without the seeming awareness of the witness. I am also familiar with the video camera placed in the ceiling as it records the interview — also largely without knowledge of the person interviewed — because I have seen many such recordings. There are also times when the interview is not even recorded, causing us to have to accept the police officer's word for what was said during an interview.

All interviews should be recorded, and the person doing the recording should be in plain sight by the witness — just like a deposition in a civil trial (or some criminal trials). It should be represented to the witness that the purpose of the recording is for nothing more than making sure the information is gathered properly and accurately.

A truthful witness has nothing to fear from such recordings; however, plainly-seen recording devices make a deceptive witness nervous. There is nothing wrong with transparency and accountability. Those items should be expected from both parties.

6. *Focus on facts and not beliefs.*

We have discussed previously the differences between a *fact*, a *belief* and a *theory*. A *fact* is something that is observed. A *belief* is something that is not observed that may or may not be true (and is often not true). A *theory* is a set of beliefs, which is even less likely to be true than a single belief.

The Reid technique encourages investigators to focus on the beliefs of a witness — to explore them in great detail. The logically sound method says, "Don't waste your time!" Most beliefs are not true. We all know this. Many people believe many things in all facets of life, even things that are far-fetched. Unless beliefs are supported by facts, the beliefs of witnesses — even expert witnesses — are highly unlikely to be true.

Stick to the facts presented by the witness — what he or she directly observed — and pretty much ignore what that witness believes about the facts. What a witness believes is not only irrelevant but also misleading.

7. *Allow the witness to speak freely and ask very few leading questions.*

During many of the interviews I have observed through recordings, the item typically confessed to was first brought up by the interrogator and not offered freely and independently by the witness. Once the interviewer/interrogator brings up his or her pet theory, the interview/interrogation can be considered to be "contaminated." From that point on, it is all "Alice in Wonderland."

The confessions that are the most reliable are the ones a witness offers freely and independently. If the confessions are truthful, they contain information that the interviewer did not know or even suspect. For that reason, probing questions intended to elicit new information are preferred over questions designed to lead the witness in a certain direction preferred by the interviewer.

Confessions, Final Part

You are still with me, aren't you? It took Reid and associates 626 pages to explain their technique. I am trying to do what they did in just a few emails. This is the final email of the "confession" series.

8. *Disclose very little of the physical evidence that you have in the case.*

Very little should be said at the outset about the physical evidence you have collected. If the witness is going to lie, you should give him very little information to guide his lies. Only disclose the physical evidence later in the process and only a little at a time. You can use the physical evidence to confront the witness with some facts — facts that might potentially falsify her account — to see how the witness will respond to the new information.

9. *Make interviews shorter and more frequent rather than fewer and longer.*

Practitioners of the Reid technique hope to wear down the resolve of a suspect. This is not necessary with the logically sound technique. The witness is to be given ample rest so that his thinking is clear.

It is important to take breaks so that investigators can consult with forensic scientists or search for more facts. The information gleaned from these breaks can provide further ideas for interview questions.

10. *If the interviewee makes incriminating remarks or even "confesses," do not stop!*

Those remarks or that "confession" has to stand up to the facts. The remarks have to be compared to the physical evidence and other witness evidence for consistency or inconsistency before they are allowed. If the remarks do not stand up, then further clarifying questions are required — perhaps even at a later date after the facts are checked. If the remarks are entirely consistent with the physical evidence and there are no inconsistencies, then those remarks are highly likely to be true. This is due to the complexity of both past events and physical evidence. Coming up with a truthful account is like using the right combination for a combination lock.

11. *"Mirandize" the witness at the end, not at the beginning of the interview process.*

Reading a suspect his rights and having him sign them away at the beginning of the interview indicates a prejudgment of guilt before having requisite proof — essentially DACPE.

Mirandizing at the end — after the person has made freely-offered incriminating remarks that are supported by physical and other evidence — demonstrates that the person has been dealt with fairly and logically. If the person does not confess or offer incriminating remarks, at least there will be substantial data in the end to demonstrate guilt beyond a reasonable doubt to a jury.

Well...that is it. If you do not see the logic in what I have provided here, you should review some of the items I have written in these emails and on my website. You are also free to email me any questions you may have — or even argue with me. Argument for the sake of clarification is worthwhile. Argument for the sake of preserving the *status quo* is not worthwhile. The *status quo* is not acceptable.

The next email will take our discussion in a different direction.

[Continue to Part 2...]