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Legal Medicine and Forensic Science: Parameters of Utilization in Criminal Cases

*Cyril H. Wecht**

I should like to discuss with you various aspects of forensic science and legal medicine, and in particular, the interface of these professional fields with the civil and criminal justice systems. Some involve products liability cases, toxic torts, and DNA—and I've have had some of the most fascinating questions arise in these areas. Occasionally cases have dealt with questioned document examination in medical malpractice cases, i.e., the analysis of records that have been allegedly "doctored" for deceitful and illegal purposes.

I was even once—the only time ever—involved as a forensic consultant in an antitrust case. This involved a steel company that was being sued by a division of the plastics industry for antitrust. It was a case that involved hundreds of millions of dollars, and as I recall, there would have been automatic treble damages if the plaintiff had prevailed. The case was quite complex. It dealt with the plastic companies' allegations that the steel industry was freezing them out of membership in a national society, which was a necessary prerequisite to their being able to market their products for use in the coverings of telephone, electrical, and other types of wires. This problem area had been involved in several fire cases I had been previously consulted in—the Kentucky Beverly Hills night club fire (just over the state line from Cincinnati); the Younkers Department Store fire in West Des Moines, Iowa; and the MGM Hilton Hotel fire in Las Vegas. In an intense conflagration, during the process of thermal degradation, the polyvinyl chloride ("PVC") that is found in some of these coverings will change into hydrochloric acid. People who are not overcome by carbon monoxide or seriously burned, and who don't really become compromised by smoke

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inhalation, cannot escape from the fires because the hydrochloric acid irritates their eyes so quickly and severely that they are unable to see. The gas also irritates their respiratory passages so that they go into a coughing paroxysm and cannot breathe. You can readily understand how this phenomenon has been the basis for some very interesting and highly complex products liability litigation.

The steel industry's defense (I don't know if it was their primary motivation) was that they were keeping the plastics companies out of this particular national professional society because they produced a dangerous product. That is the reason they were blackballing them, which had nothing to do with economic competition or cornering the market; it simply was a matter of protecting people in the future who might otherwise die because when there are fires, the plastics product (PVC) will result in their being incapacitated. And so I was contacted by the steel company to testify as to the toxic potential of these plastic wire coverings. I refer to that case to give you an idea of how forensic sciences can become involved in seemingly unrelated non-biological civil matters. Inasmuch as all fire deaths may potentially involve this kind of issue, we have to keep in mind as forensic scientists what appropriate and necessary pathological and toxicological tests we should perform in such tragedies.

Permit me to talk about the history of legal medicine and forensic sciences. The reason I do this is not to give an academic, didactic lecture to a sophisticated group like this, but rather to emphasize something that so many of my colleagues in medicine do not appreciate, or refuse to accept, something that so many people in the legal profession are unaware of. Long before anybody ever even coined the names or conceived the concepts of rheumatology, dermatology, cardiovascular surgery or any other medical specialty, there was already a societal and intellectual awareness of the relationships between law and medicine, and the need to apply forensic scientific concepts in death investigations (to the extent that they were known) in appropriate instances. For example, in the assassination of Julius Caesar, who sustained twenty-three stab wounds inflicted by his colleagues in the Senate in Rome, some very erudite forensic investigator (I'm not certain how he did it) came to the conclusion that one particular wound was fatal and the others were not. It is a really remarkable thing that somebody would have even thought to undertake such a study two thousand years ago. Amazingly, we jump to the end of the twentieth century and find medicolegal autopsies being badly bungled because the officials in charge are negligent, incompetent or simply unqualified in dealing with

important and sophisticated forensic scientific questions.

In the Code of Hammurabi, 21st to 20th centuries B.C., we already find references to the joint application of legal and medical concepts. And then we see in ancient societies—the Hebrews, Phoenicians, Egyptians, Chinese—references to these kinds of investigations in their juridical codes and other historical documents. Moving into later centuries, in the Code of Justinian around 530 A.D., there was a specific reference to the need to apply law and medicine for purposes of dealing with issues involving various societal problems. The Talmud is replete with medicolegal references—in the seventh, sixth, even fifth centuries—that the Diaspora as it was called (Jewish populations in different countries) were advised to apply in controversial and complex issues. Especially at that time, in the region of Iberia and North Africa, one finds references by Talmudic scholars to numerous medicolegal concepts in order to try to understand age-old debates with moral and ethical overtones. Some of these debates were the preludes, unknowingly at the time of course, to several perplexing bioethical issues that confront us today.

We then move to something that is so very important to us because of the Anglo-Saxon heritage of our law, namely, the development of the office of coroner. Crowners, as they were originally called, were noble knights appointed by the king to protect the crown's proprietary interests in certain death cases. When there was some kind of accident or other death of an apparent unnatural nature, various individuals and groups might attempt to take possession of the real and personal property that became available. There were the powerful clergy and titled nobility, earls, dukes, and barons. The king, unlike monarchs of later centuries, was not a powerful centralized authority. He needed his own personal representatives to fight for what he considered to be his proper due in those instances. So he appointed loyal knights of the realm who would go to these death scenes and convene a small group of local townsmen—landowners. They would review the facts. Then, a determination as to fault or guilt would be made, and property might be confiscated or transferred accordingly. If a carriage with six horses had been involved in the negligent death of someone, if a ship had gone aground on the shoals and killed some people and there was a cargo, these instruments of death might be confiscated and taken by the king. They were referred to as the *deodand*, a giving unto God, God being the king. That was the birth of—the *raison d'être*, the true objective—the present day coroner system. It was not conceived in science, nor was it related to a recognition of the need to apply legal medicine to the resolution of societal

problems. That was the heritage of the office of coroner when it was transposed to the colonies several centuries later.

In contrast, in Europe after the passage of the Dark Ages and the advent of the Renaissance, scholars and public leaders began to develop institutes of legal medicine. They had in mind the application of law and medicine in dealing with various societal problems. When I was in Rome in 1965 at a post-graduate seminar sponsored by the Pittsburgh Institute of Legal Medicine, I had the opportunity to see the huge compendium written by a famous physician to the Pope, Professor Zacchia. They have the original copy there—*Questiones de Medicini Legale*—postulated by this great medicolegal scholar around the beginning of the sixteenth century. Many of these principles are applicable and valid today.

Two centuries earlier, archaeologists and historians had uncovered a written code known as Hsi Yuan Lu, promulgated by Chinese scholars for reference in the investigation of suspicious and seemingly unnatural deaths. Such field investigators today in our society would be called coroners or medical examiners. It is amazing that the instructions and guidelines prepared for those people back in the fourteenth century would have so much legitimate applicability today. So we note these institutes of higher learning and education developing in the countries of western Europe and Asia. Powerful colonial nations, the Portuguese, Spanish and others, took their cultures to lands elsewhere in Africa, Asia, South and Central America. They transposed their judicial systems and the ancillary features thereof; and among them, of course, were their approaches to official governmental medicolegal investigation. In contrast, America inherited the English coroner system at a time when it was at a very low academic level in England. While it may have started off utilizing educated knights of the realm, it had deteriorated into a political free-for-all, involving individuals who did not care much about anything except getting hold of some property for themselves or their principals.

In 1805 Vienna was the capital city of the world in terms of the practice of medicine, and it remained so for more than a century. In fact, before the creation of the American medical certification boards, when United States physicians wanted to specialize in various areas of medicine and surgery, many of them went to Vienna for their training. It was the Mecca. Therefore, it is significant to note that in 1805 there was a Chair in Forensic Pathology created at the Vienna University Medical School before there was a Chair established in pathology. That is truly remarkable and demonstrates more than any of my

words can get across to you about what advanced societies recognized and appreciated in coping with various medicolegal matters.

It was not until 1877 that the first official change took place in America. As often is the case, it arose from the ashes of a scandal. There were twenty-three coroners in Suffolk County—Boston and surrounding areas—and each one collected a fee for the work they performed. The governmental system that was extant at the time was dependent on the earning of fees. What happened was that a bunch of coroners would use the same body, passed amongst themselves to collect fees. The bodies were usually infants and small children because they were easily transportable. The local coroners would just put them in a bag or a little black box and transport them from A to B to C to D. The people of Boston were not too happy about this illegal and disgusting practice when it was exposed, and so they adopted the first medical examiner system. Ironically, it was almost a century later in the very jurisdiction that had adopted the first non-political appointive medicolegal investigative system in America, that somebody with the fancy title of Deputy Medical Examiner made the incredible decision not to do an autopsy on the body of a young woman found in a submerged car—the Mary Jo Kopechne case!

It was not until 1917 that the next change took place in New York City, and there again, as a result of scandal involving local coroners. The New York City Medical Society and some legal groups got together and pushed through a medical examiner system for New York City. Thereafter, there were similar changes made in several other jurisdictions. These legislative revisions moved at a fairly good pace. There was a National Municipal League headed by a man named Richard Childs, who took this issue to heart and kept promoting it. In 1939, a statewide system was created in the State of Maryland and in 1949, the Commonwealth of Virginia did likewise. Many other county jurisdictions followed shortly thereafter. However, except for a few small states, the larger states made changes only in their metropolitan areas. In Pennsylvania, you will recall it was Philadelphia alone that was able to make that change under the provisions of their Home Rule Charter in 1950. When Richardson Dilworth and Joseph Clark led a political revolution in Philadelphia, among the changes that were implemented was the elimination of the coroner's office and the adoption of a medical examiner system. And that's the way it stood in Pennsylvania until a few years ago. Now, Montgomery and Delaware Counties have medical examiners in place while the rest of the state re-

tains the coroner system. Medical examiner systems will be found in almost all of the large metropolitan jurisdictions of the country. In Texas, for example, they exist in Houston, Dallas, San Antonio and Galveston. In California, they have medical examiners in Los Angeles, San Francisco and Orange County. In Illinois' Cook County (Chicago) they made a change some years ago, and Michigan's Wayne County (Detroit) did likewise.

What is involved is the investigation of violent, sudden, suspicious, unexpected, unexplained, and medically unattended deaths for the purpose of determining the cause, manner, and mechanism of death, and sometimes the time and place of death and sequence in multiple deaths. Several of these issues arose in the O.J. Simpson case. And once again, we see a system that had been in place for many years deteriorating ever since the Los Angeles politicians removed Dr. Tom Noguchi as the Chief Medical Examiner. That office has been slipping down and down ever since. Each year the L.A. County Board of Supervisors cuts their budget more and more. In fact, their answer to the debacle that occurred in the Simpson case involving the Medical Examiner's office was to cut the budget by \$200,000. Because of such cuts, they have bodies stacked up for days at the Los Angeles County Medical Examiner's Office. Recently, I was told that there were 260 bodies waiting for autopsies to be performed. In a routine case, you will have to wait seven to ten days to get a body out of the office. How they get away with it, I don't know. In Allegheny County, if we keep a body more than twenty-four hours, the funeral directors are up in arms.

Returning to the Simpson case, we find a medical examiner system that was put in place back in the 1940's in Los Angeles, so it's been around for a half-century. And yet, there has evolved in recent years a practice (not by law, just practice and custom) wherein the homicide detectives do not contact the Medical Examiner's office until they are ready to have the body removed from the scene. In the Simpson case it was 10 1/2 hours after the discovery of two people were found brutally murdered. One of the defense attorneys asked a couple of the detectives at the preliminary hearing, "who do you think should make these decisions?" The detectives stated, and I believe quite sincerely, that it was their decision. They would determine when the Medical Examiner's office should be notified. That does not happen in Allegheny County. It hasn't happened in a long time, and I'm satisfied that it will not happen. But this is the approach and attitude that exists in L.A. and many other jurisdictions. You pay a heavy price for such a delay in scene investigation by a trained forensic scientist. You give up the opportunity to make a

lot of important determinations and analyses early on, many of which are not only compromised but lost forever.

Now I should like to touch upon some cases of great interest and notoriety that you would be aware of without getting into their socio-political ramifications or even the question as to exactly what happened. My point is not to relive these cases with you but to demonstrate how things can be badly messed up through inadequate, incompetent or delayed forensic scientific examinations. We are still, in 1995, debating in great detail the hard forensic scientific evidence in the John F. Kennedy assassination. I don't know whether most people understand it or not, but the two pathologists called upon by the United States Government to do an autopsy on the President in 1963, killed by multiple gunshot wounds, with determinations to be made as to angle, range, trajectory, sequence, lethality, etc., were career naval pathologists who had never performed a single medical-legal autopsy in their entire professional careers. They had never spent one day in a forensic pathology training program. They had never even gone to the Armed Forces Institute of Pathology ("AFIP") in Washington, D.C. to attend one of the forensic pathology seminars. The federal government was well aware of the specialty of forensic pathology. In fact, when I was in the Air Force from 1959 to 1961, and I knew that I was going to train in forensic pathology to tie it in with legal medicine, my chief permitted me to go to Washington, D.C. to attend such forensic pathology seminars in 1960 and 1961. Such experts had been used by the federal government in many different capacities following World War II. However, when the President was assassinated, the foremost civilian experts like Milton Helpert of New York City, Joe Spellman of Philadelphia, Geoffrey Mann of Virginia, Russell Fisher of Baltimore, and Alan Moritz of Cleveland, all within an hour driving or flying time of D.C., were deliberately excluded. Obviously, this was done so that the federal government would have complete control of the autopsy. The point is that for whatever the reasons were, the failure to use forensic pathologists resulted in an incredible screw-up. We're still debating today exactly where the wounds were located, how many wounds there were, the angles and direction, etc.

The Robert F. Kennedy and the Martin Luther King cases, in 1968, again presented real problems. We still have serious debates and discussions about the wounds and the trajectories in Dr. King's death. Senator Kennedy's case is somewhat paradoxical. Dr. Tom Noguchi did perhaps the most thorough medical-legal autopsy ever performed. It could not have been more precise and detailed. One of the things I suggested to Dr. Noguchi

was that he invite the federal agents to send in forensic pathologists from the AFIP, and they did. They sent in three military experts who knew Tom. Everybody agreed—there was no question at all then about the wounds, and what the surgeons had done, etc. Thus, there was no obfuscation such as had occurred in JFK's case where the surgeons had cut through a bullet wound in the neck that later was misinterpreted by the inexperienced pathologists as a tracheostomy.

In the RFK case, Dr. Noguchi testified before a grand jury and specifically stated that the shot that killed the Senator was fired from a distance of 1 to 1 1/2 inches behind his right ear. Twelve forensic pathologists from that office, the AFIP, and two of us as independent consultants, all concurred. This conclusion was corroborated by separate ballistics studies using pigskin and the same kind of weapon fired by Sirhan, an Iver-Johnson .22 long. There was no question at all. Dr. Noguchi gave that testimony; it was all in the grand jury record. This case came to trial, and an experienced criminal defense lawyer, Grant Cooper, perhaps trying to save Sirhan's life, proceeded solely on the basis of a "diminished capacity" defense. That's all he was interested in arguing. I find it a little difficult to understand that, but in any event, what must be accepted is the official record. The transcripts show that Dr. Noguchi was never asked by the prosecution on direct or on cross-examination by Mr. Cooper, about range of fire and the trajectories. And yet people ask: "Where do all those conspiratorialists get their crazy ideas?" In the Robert F. Kennedy case, Sirhan shot at RFK—there is no dispute about that. The question is, did somebody else shoot, also? My point is that these are the kinds of horrendous debacles that arise when there is not proper forensic pathology, when there is not good forensic scientific investigation, or attorneys and judges who do not appreciate the importance of these concepts. And so here we are twenty-eight years later with the question still pressing on the minds of many serious researchers, namely, the possibility of a second shooter.

I've already referred to the Mary Jo Kopechne case. Here, incredibly, the decision not to perform an autopsy on a young woman found dead in a submerged car was made by a physician with the title of "Deputy Medical Examiner." I don't know how much this decision was influenced by the Kennedy family. In any event, nobody made a move at that time to do a post-mortem examination. The district attorney had a chance to intervene and did not. The body was then transported to Pennsylvania and buried in Luzerne County. I was consulted by Massachusetts District Attorney Edmund Denis, who was referred to

me by F. Lee Bailey. I went to Wilkes Barre and testified. Judge Brominski could not have been nicer. He was a gentleman to everybody. I testified that for the same reasons the autopsy should have been done initially, it still should be done. There were findings that would be compromised, some that would be lost, and others that would be obfuscated, but it still should be done. There were witnesses on both sides. The Kennedy attorneys and Mary Jo Kopechne's parents were strongly opposed. As I recall, it was October of 1969. I believe the population of Luzerne County is about 65 to 75% Catholic, and I think Judge Brominski was up for retention election the next month. I'll let you decide what you think his ruling was going to be. I think I would have made the same ruling under those circumstances. Everybody was there arguing against it, and these government officials from Massachusetts wanted to dig up the body of this young woman. They had her just a few months before in their jurisdiction, and they had failed to act responsibly.

I must tell you a cute story regarding this episode. Judge Brominski came to the hotel in Wilkes Barre at lunchtime. We were all dining there. There was the Massachusetts table with the state police and D.A. Denis, and I was there, also. There was the Kennedy table, and the Kopechne table, and the judge, in judicial statesman-like fashion, dropped by each table to say "hello" at lunchtime before we went back to court. I'll never forget when he came to our table and said: "I want you to know, fellows, it's not true what they're predicting, that just because I'm Polish, I'm going to grant the order for the autopsy, but deny the order for the exhumation." Of course, as it was, he denied the order for both. So here is an example of how ninety years after the establishment of the first M.E. system in the U.S., an important case got screwed up because somebody did not do what they were supposed to do.

The Black Panther shootout in Chicago is another case that developed a more sinister overtone subsequently. Here, you have an aspect of incompetence and most likely, a much bigger element of deliberate coverup. The Chicago police department was quite corrupt and politically controlled in those years. They claimed that the Black Panther leader, Fred Hampton, was killed when he and other members of his group opened fire on the police. That was the original official version that remained unchallenged until outside forensic experts were consulted to review the shoot-out and the death of Hampton. There was an exhumation and a second autopsy, and then there was a third autopsy. I reviewed all three autopsies, and I raised questions about the barbiturate level, which was in the lethal range. The

police claimed that Fred Hampton was shooting all those bullets, and yet, if he wasn't dead, there was no way in the world that he would have been conscious. He had to have been at least comatose with a level of over 2.0 milligrams percent of a fast-acting barbiturate. Any more than 1 milligram-percent is quite toxic and often lethal. Not too many people have survived with a 2 milligram-percent level of a fast-acting barbiturate. They had referred to the gastric contents in the first autopsy; however, the second autopsy showed that the stomach hadn't even been opened. I contacted my friend and colleague, Professor Herb MacDonell, and got him involved. Herb, who recently testified in the Simpson case, is a blood spatter expert and an outstanding criminalist. He is the one that used dowels and demonstrated that all the shots (almost 100) had been fired into the house, and not any shots, except possibly one, had been fired from inside out.

A similar case a few years later was the so-called Glenville shootout. Again, this was a situation involving black civilians and white policemen in Cleveland—the Glenville area of Cuyahoga County. I was a consultant in this case to the defense attorneys in a subsequent murder trial that arose from that confrontation, in which several civilians (all blacks) and three police officers (all white) were killed. I went to the Cuyahoga County Coroner's Office to look at the autopsy reports, and found there were a couple of wounds of entrance and exit that were mixed up. I could not help but feel that should not have happened. That facility had a reputation of being a good medico-legal investigative office. But what bothered me most of all was the fact that there were no toxicology reports. So I kept pressing them. I told the defense attorneys that they should get the toxicology reports because they might be very important. They subsequently got the reports on everyone who had been killed. The police officers at that point in time, when the shooting broke out, had been on duty for about four to five hours. One had a blood alcohol level of .23, one had a blood alcohol level of .17, and the other had .09. Working back and applying the usual dissipation rate of alcohol, an average of .017 per hour, you would multiply that times four and add at least .06 to the post-mortem levels that were reported. Therefore, one officer, when he started duty, was at about a .3 level. The other guy, when he started duty, was about .25. The third guy was about .15. I guess that's how you got through the day, a difficult task of being a police officer in Cleveland in those years. This was another case in which officials deliberately tried to cover up a law enforcement mess.

Now, let us talk about the Elvis Presley case. This is another

kind of situation in which local officials played games. They finessed what should have been a medical examiner's case into what was purported to be a private autopsy. However, it was attended by the medical examiner, who then conducted an immediate press conference before any microscopic slides or toxicology reports had come back, and announced that Elvis had died from heart disease. There were twelve central nervous system depressant drugs in Elvis Presley's body—analgesics, sedatives and tranquilizers. Three of them were at significant, potentially toxic levels. These drugs act in a cumulative manner, what we call a synergistic fashion. There's no question at all in my mind, and in the minds of the civilian pathologists who finally spoke about this case in later years, that these drugs killed Presley. He did not have any significant cardiac pathology.

The point I would like to emphasize is that the courts usually become involved in these matters. In every one of these situations that I have referred to, appellate court judges, like many of you here, and trial judges, were involved. These are not matters that have no public relevance or practical impact.

I would now like to talk about what the forensic sciences are, and how you as judges can ascertain whether or not someone has sufficient standing by virtue of educational achievement and experience to be considered a true expert in such medicolegal and forensic scientific cases.

Let me illustrate by referring to another fairly recent case that comes to mind. One of the people convicted in the World Trade Center bombing was the person who was charged with shooting Rabbi Meir Kahane in New York City a few years ago. In that case, the Medical Examiner's office, in deference to the ultra orthodox Jewish community and Kahane's family, did not perform a complete autopsy. Therefore, the precise pathological findings, which were very important, were simply not available. Whether William Kuntsler would have succeeded in obtaining an acquittal for his client, Nosair, in any event, I can't say. However, I believe it is most likely that he would not have been able to do so if all the bullets had been recovered and matched to Nosair's gun. Unfortunately, that case was sorely lacking in forensic scientific evidence when it came to trial because a bad decision had been made by the M.E. Isn't it interesting to reflect upon the fact that if Nosair had been convicted in the Kahane case, there might not have been a World Trade Center bombing? Who knows? It's a fascinating and interesting thought to reflect upon.

And then finally we come to the Simpson case. I'm not going to relive the case in detail because it is still fresh in your minds.

You saw the incredible cascade of errors beginning with the failure to call the Medical Examiner's office to the scene immediately, the autopsies which were not handled very expertly, and finally, the forensic pathologist who did the autopsies not being called to testify at the trial. If there is a medical examiner, a board certified forensic pathologist, who is still actively and fully employed by the county and who had performed the autopsies, should the judge permit someone else to come in from that office who had only seen the bodies for a minute or two in passing and had not actually participated in the autopsies at all, to give eight days of testimony about those autopsies, while the man who actually did the autopsies is a couple blocks away? Dr. Irwin Golden was never called. Dr. Lakshmanan Sathyavagiswaran was called, however, and had to give eight days of testimony because his L.A. Medical Examiner's Office had handled the cases so poorly.

The same kind of situation was recently played out in the second Menendez trial. In the Menendez case, guess who did the autopsies on Jose and Mary Menendez? Dr. Irwin Golden. And guess who was not called by the prosecution to testify in the retrial of the Menendez boys? Dr. Irwin Golden. The prosecution instead consulted a Ph.D. engineer, Dr. Roger McCarthy, from Failure Analysis Associates and used him as their "forensic scientific expert," a combination forensic pathologist, criminalist, blood spatter, and ballistics superspecialist. (I have since learned that all the jurors totally rejected McCarthy's animated computer reconstruction of those murders. They reportedly took five minutes to do so!) So these are the ways in which messed-up cases play out.

One of the other speakers has referred to a subject I planned to touch upon, namely, the bizarre tale of one Fred Zain, formerly from our neighboring state of West Virginia. I'm sorry that some of the West Virginia judges weren't able to be invited to this conference. It would have been interesting to hear from them. Fred Zain's activities went unhampered, unfettered and unchallenged for years and years. Is it conceivable that law enforcement officers, fellow crime lab workers, other criminalists, private attorneys, prosecutors and some judges never came to know or at least have had any suspicions at all about Fred Zain's professional bona fides? I think not. He left there and went to Bexar County, San Antonio. Somehow, Dr. Vincent DiMaio, who is a very fine forensic pathologist, the Chief Medical Examiner there, hired him. And Zain proceeded to do the same things down there. There is now quite a mess, involving hundreds of criminal cases in West Virginia and dozens

of cases in Texas, that are all screwed up. Many convicted people will be getting new trials, and a few will have to be released. So you see, these kinds of problems have very real and substantial pragmatic ramifications. I'm not just telling you about interesting trials. You can appreciate how they play out in the courtroom. The monies that they cost our communities, the tremendous loss of time and effort, and many grave injustices are not to be ignored or lightly dismissed.

In Texas there was an even more bizarre story which you may have heard about. In fact, there was a recent piece in a recent edition of the *American Bar Association Journal*.¹ This isn't the first time it has been written about. Dr. Ralph Erdmann was a pathologist in west Texas. Mike Wallace of "60 Minutes" interviewed him on the show. Erdmann knew that Mike Wallace was coming for that purpose. Now, if Mike Wallace was coming to my home, I'd have a cleaning service in for three weeks before and make sure that my tie, shirt and suit were brand new, and my kids were well scrubbed, etc. This guy brings Mike Wallace into his lab and opens up the refrigerator where he keeps his toxicology specimens. There's a bottle of Coke, a sandwich, urine and blood specimens, etc. all mixed in with important autopsy biological specimens. Erdmann was a prosecutor's dream—whatever testimony the prosecution needed, Erdmann provided. It was just unbelievable. There was the case of a 29-year-old black man who was charged with the murder of a woman, allegedly by strangulation. The defendant insisted that he had only robbed the premises but never touched the woman. The defense tried to bring up the question of heart disease—whether the old woman had a heart attack (which would have raised another kind of interesting medicolegal question, but certainly different than intentional strangulation). However, Erdmann testified and insisted that her coronary arteries were fine, the arteries of a person 50 years younger. Indeed they were! He was actually speaking the literal truth. He had taken coronary arteries from somebody who was 32-years-old from another autopsy he had done. He brought them into this case and testified under oath that those microscopic slides were the coronary arteries of the 80-year-old woman. So here again, we confront the same question—was it possible that people did not know about Erdmann? That is highly unlikely. Is this acceptable forensic pathology, official medicolegal investigation in America in the

1. Geoffrey A. Campbell, *Erdmann Faces New Legal Woes: Pathologist Indicted for Perjury in Texas Murder Trial*, *A.B.A.J.*, Nov. 1995, at 32.

1990's, as we prepare for the 21st century? I would hope not.

Much has happened in recent years in area of medical technology. We have CAT scans and MRI's. We now have positron emission tomography ("PET"), in which we can actually see the brain functioning. With MRI's, we can see things that are pea sized and smaller. But with the PET scan, you can actually see the way different parts of the brain relate to each other in terms of neurophysiological function.

I've been involved in three or four cases in which animated reconstructions and computer simulations were utilized. One was a police shooting in a civil matter in West Virginia, a civil rights action. Another one was a products liability case in Iowa involving an accidental gun discharge. There was one in Philadelphia, another products liability case, involving the accidental shooting of a gun. And a homicide case in Hawaii. Fascinating technology.

There is image processing with computer analysis. An incredible new technique, which permits us to visualize things in pictures that are not visible to the naked eye or usual magnification processes. There are many things that are going on in the world of medicine and science today that are applicable to forensic scientific investigation. These will revolutionize both the civil and criminal justice systems in the 21st century.

There are established professional organizations that deal with the validation of areas of expertise. Whether somebody is a good expert or not, whether a judge or a jury chooses to believe that expert, are other questions. Who is an expert and what do the titles mean? There is a group called the American Board of Forensic Examiners that has recently flooded the mails. I think if I had what they've paid in postage in their solicitation campaign, I could retire. You'll have these people coming into your courts and they are going to testify that they are members of the American Board of Forensic Examiners. There is no prerequisite test or educational requirement to become a member. Nothing but payment of dues. Just fill out an application and submit your check. I looked at their literature and there wasn't one name that I had ever heard of in the forensic scientific field.

In contrast, The American Academy of Forensic Sciences, which was founded in 1949 with six sections originally—pathology, jurisprudence, toxicology, anthropology, questioned documents, and criminalistics—is the largest and most prestigious organization of forensic scientists in the world. There are now nine sections with over 2,500 members. The American Academy of Forensic Sciences is a professional society that has fixed requirements. A person starts off as a provisional member, then

becomes a member, and ultimately a fellow in one of these different sections based upon education, experience, performance, presentation of papers at the annual meetings, etc. And it is a meaningful achievement.

And then there is the American College of Legal Medicine (the "ACLM"), for people who have both medical and law degrees from American or Canadian medical and law schools. The ACLM has a board certification examination that's been in place since 1982. There are specialty boards like the American Board of Pathology which created a subspecialty field of forensic pathology in 1959 that requires a year or more of training at an approved medicolegal investigative center. We established such a program at the Allegheny County Coroner's Office when I was there in 1971 that remains actively in place today. These people are usually referred to as fellows, and there is a separate examination in forensic pathology after four years of post-graduate training in basic pathology. The American Board of Psychiatry has a subspecialty in forensic psychiatry, and there are Boards in forensic toxicology, forensic anthropology, forensic odontology, and questioned documents. These are formal boards, several of which are sponsored by different professional organizations, including the American Academy of Forensic Sciences.

Decisions by trial judges and appellate courts concerning the definition of expert testimony are frequently quite difficult and controversial. The *Frye v. United States*² standards have been modified over the years with the advent of the Federal Rules of Evidence, and more recently, the U.S. Supreme Court decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*³ Trial and appellate court judges have varied significantly in their rulings as to what constitutes a recognized area of expertise, and whether a particular individual is a true expert in that field. One must first deal with the question of admissibility, and then with the degree of weight and credibility to be given to such testimony.

The role of judges is obviously critical in these matters. By now, the United States should have the most sophisticated medical-legal investigative system in the world. The complexity and sheer quantity of civil and criminal cases that require medicolegal and forensic scientific expertise must be fully appreciated by the judiciary if our civil and criminal justice systems are to perform at the highest levels of impartial objectivity and efficiency.

2. 293 F. 1013 (D.C. Cir. 1923).

3. 509 U.S. 579 (1993).

