LETTERS FORUM: FORENSIC LABS

EDITORS' INTRODUCTION

Professor Randolph Jonakait's *Forensic Science: The Need For Regulation*, 4 *Harvard Journal of Law & Technology* 109 (1991) generated a tremendous amount of discussion and controversy regarding the reliability of forensic lab work and the desirability of regulating such labs. The Article received extensive coverage in the national media this Fall. *See, e.g., Labs Make Too Many Errors, Article Says, The Wall Street Journal*, Sept. 6, 1991, at B3; ABC World News Tonight Broadcast, Sept. 17, 1991. Never have we received so many letters, both critical and supportive, relating to a single Article. Due to this unusually high level of interest, we have decided to depart from tradition and publish a representative set of the letters that we have received. A response by Professor Jonakait follows these letters.

* * * * * * * * * * * * * * * * * * * *

I appreciate the opportunity to respond to Professor Randolph Jonakait's article *Forensic Science: The Need for Regulation*, which appeared in the Spring 1991 issue. In his article Professor Jonakait calls for mandatory regulation of the forensic sciences. While I share Professor Jonakait's concern for quality control in forensic science, I think his wholesale scathing indictment of the state of forensic science and the competency of forensic scientists is misplaced. The inherent danger in Professor Jonakait's article is the misinformation it conveys to those unfamiliar with forensic science who will take his statements at face value without closely examining his authority. *See, e.g., Labs Make Too Many Errors, Article Says, The Wall Street Journal*, Sept. 6, 1991, at B3. Some of his premises are based on outdated and incomplete information. Thus, Professor Jonakait portrays an inaccurate view of the state of forensic science today.

Unfortunately, Professor Jonakait's article ignores the strides that have been made in the recent past to improve the laboratories and quality of forensic science. Thirteen states have passed legislation establishing crime laboratory councils whose responsibilities include, among others, evaluation of forensic science training and development programs, offers of recommendations on policies and procedures to improve the operations of laboratories, and establishment of standards of education and experience for professional and technical personnel employed by the laboratories. *See, e.g., Florida Statutes* § 943.356 (1990).

Efforts to improve the quality of forensic science have been spearheaded by the forensic scientists themselves. Professor Jonakait fails to discuss the many existing accreditation and certification programs. Presently, eighty-four laboratories are voluntary participants in the American Society of Crime Lab Directors' ("ASCLD") accreditation program. ASCLD was founded in 1974. Its membership consists of the directors of the more than 250 crime laboratories whose scientists spend more than half of their time studying forensic science. ASCLD has adopted mandatory proficiency testing for all accredited laboratories.

Professor Jonakait's statement that a large segment of the forensic science community has resisted a voluntary certification program is based on outdated information. While there was resistance to the certification movement more than twelve years ago, it is now accepted in many areas of forensic science. More than forty percent of the almost four thousand members of the American Academy of Forensic Sciences, the largest forensic science organization in the United States, are board certified. Board certification is available from certifying organizations such as the California Association of Criminalists, The International Association of Identification, The American Board of Forensic Document Examiners, The American Board of Forensic Anthropology, The American Board of Forensic Odontology, The American Board of Pathology, The American Board of Forensic Psychiatry and The American Board of Forensic Toxicology. These boards have established national standards. Their certification programs are open to private and government forensic scientists.

Another recently created certifying body is the American Board of Criminalistics ("ABC"). The ABC was incorporated in 1989. The ABC will issue a certificate in basic criminalistics and in the disciplines of forensic biology, drug identification, fire debris analysis, and trace evidence examination. The initial member organizations are The California Association of Criminalists ("CAC"), Mid-Atlantic Association of Forensic Scientists ("MAAFS"), Midwestern Association of Forensic Scientists ("MAFS"), Northeastern Association of Forensic Scientists ("NEAFS"), and Southern Association of Forensic Scientists ("SAFC"). Those organizations' members voted to become members of the ABC.

I also take issue with Professor Jonakait's allegation that little forensic science research is ongoing. The National Institute of Justice has expended 1.3 million dollars in grants for forensic science research in the last year. One need only read the quarterly *Journal of Forensic Sciences* to see the published results of ongoing research or to attend the annual American Academy of Forensic Sciences' meeting or the triennial International Association of Forensic Sciences' meetings to view the hundreds of presentations made regarding the results of research in the forensic sciences.

Contrary to Professor Jonakait's statements, forensic scientists have also instituted and routinely follow tested procedures. Protocols exist in such areas as serology, firearms, toxicology and odontology. In areas where there are no protocols, such as DNA, they are being developed, often at the insistence of the forensic scientists.

His reliance on outdated studies such as the thirteen-year old LEAA Crime Laboratory Proficiency Testing Research Program, while not discussing more recent studies, presents a skewed picture of the abilities of forensic laboratories and forensic scientists. Professor Jonakait's reliance on fringe areas of forensic science, such as spectrography, for authority while ignoring the traditional, mainstream areas, such as pathology, fingerprint examination, and toxicology, also presents a view that lacks balance.

While I share Professor Jonakait's concern regarding the fact that the courts and lawyers usually lack scientific training and are thus unable to evaluate or challenge science, he fails to discuss the fact that there has been significant improvement made in forensic science education for lawyers and judges. At present more than forty law schools teach law and science courses as does the National Judicial College in Reno, Nevada. There also have been many continuing legal education programs established to educate attorneys in forensic science. For example, the National Association of Criminal Defense Lawyers' 1990 annual meeting addressed contemporary issues in expert testimony.

Admittedly, the forensic science profession is not without room for improvement. However, before calling for wholesale mandatory regulation of the forensic sciences, I would urge examination of the improvements that have been made through self-regulation. Recent strides made by forensic scientists regarding quality control of the most recent data demonstrate that self-regulation is addressing many of the problems broached by Professor Jonakait.

Carol Henderson Garcia
Associate Professor of Law
Nova University
Shepard Broad Law Center
Fort Lauderdale, Florida

* *

Professor Jonakait's article raises serious questions concerning the validity of some of the most common forensic tests admitted in courts on a routine basis. Generally speaking, judges and lawyers are ill-equipped to understand even some of the most basic forensic tests and lack the

ability, without extensive research, to discern whether a scientific test may have produced an unreliable or inaccurate result.

A forensic test often has an aura of infallibility that, unless properly challenged, may be the most compelling piece of evidence in the case. Unfortunately, particularly where counsel is appointed, the lawyer may not take, or have the time to comprehend, the underlying scientific principles of a forensic test in anything more than a superficial manner.

The failure to understand forensic evidence may result in conclusions being reached that are contrary to scientific principles or simply inaccurate, but are admitted into evidence unchallenged before the jury. As Professor Jonakait notes, the result can be the conviction of an innocent person based upon unreliable scientific evidence.

For example, in *State v. Glen Dale Woodall*, 385 S.E.2d 253 (W.Va. 1989), Mr. Woodall was convicted of numerous counts of sexual assault, kidnapping, and aggravated robbery, and sentenced to a maximum of 335 years and two life terms with no possibility of parole. His convictions were based entirely on circumstantial evidence, with the most critical evidence involving serological and hair analysis. In particular, the State's expert stated that only six out of ten thousand men in Cabell County, West Virginia would have the same four blood types as Mr. Woodall and the assailant. The State's expert further stated that not only was a single hair found at the crime scene similar to Mr. Woodall's hair, but that in his opinion, he "had no reason to believe that the hair could not have originated from Mr. Woodall, and it would be very unlikely that due to no dissimilarities identifiable and distinguishable, that the hair could have originated from anyone else."

After spending four years in prison for crimes committed by someone else, Mr. Woodall was released on bail in July, 1991, following a habeas corpus proceeding, based upon PCR DNA test results that excluded him as the donor of sperm in both assaults. During the habeas corpus proceeding, it was determined by a number of experts that the serological data and the hair analysis presented at trial were grossly exaggerated and, with regard to certain conclusions presented to the jury, without any scientific support. A better understanding of the forensic tests used in that case by all parties involved could have prevented this travesty from occurring.

Whether or not forensic laboratories are regulated by some federal agency or other entity is largely an issue for the scientific community to decide. There appears to be considerable disagreement among forensic scientists concerning the merits of the regulation proposed by Professor Jonakait, and as a lawyer, I feel woefully unqualified to express an opinion either way. However, whether or not forensic laboratories eventually are regulated, the practical significance of Professor Jonakait's

article is alerting judges and lawyers to the fact that all forensic evidence must be viewed with a more critical eye. With the advent of DNA testing, which requires a relatively sophisticated understanding of genetic principles, lawyers will have to devote more time to the study of basic biology and less to reviewing statutes or case law in preparing for a case.

Lonnie C. Simmons
DiTrapano & Jackson
Counsel for Glen Dale Woodall
Charleston, West Virginia

* *

The article in your Spring 1991 issue presented from a defense-oriented advocacy position a blanket indictment of crime laboratories, declaring in shrill terms that the entire forensic community is in dire need of regulation. The article impugned the professionalism and integrity of forensic scientists, and was an apparent attempt to undermine public confidence in the criminal justice system by so glibly condemning the work of crime laboratories in the U.S.

The article contained many references but was not well researched. Instead, its premise is based on a hoary study from 1978 by the former Law Enforcement Assistance Administration, a few credible sources of information whose statements are unfortunately taken out of context, and many obscure references that bear no relevance to the practice of forensic science.

The article failed to acknowledge developments during the last decade which have galvanized the forensic community and contributed significantly to ensuring the quality of work performed in crime laboratories. For example, the American Society of Crime Laboratory Directors ("ASCLD"), begun in 1974, has successfully fostered standards and consistent good practice across forensic laboratories. In 1981, ASCLD began a laboratory accreditation program which, to date, has formally accredited nearly a hundred crime laboratories. Also in 1981, the FBI established the Forensic Science Research and Training Center ("FSRTC") as a national resource with programs to research new forensic examination techniques, provide specialized training to crime laboratory personnel, conduct technical conferences on subjects cutting across the forensic community, and host visiting scientists from State and local crime laboratories.

Forensic DNA testing is a recent example of how the forensic community has worked together quickly and effectively to institute standards

for an emerging technology. Working with private industry and the forensic community, the FBI Laboratory developed and validated the current DNA testing protocol which was transferred to State and local crime laboratories via training at the FSRTC. Through the National Technical Working Group on DNA Analysis Methods, the FBI Laboratory and forensic DNA laboratories developed standards for quality assurance and proficiency testing that are now generally accepted. Widespread use of a compatible DNA protocol offers a major benefit to law enforcement by allowing crime laboratories to share DNA identification records when investigating violent crimes such as rape and murder. Uniformity in testing methods also serves to instill confidence in the reliability of test results.

Unfortunately, by focussing exclusively on proficiency testing as the principal means for raising the quality of forensic examinations, Professor Jonakait subscribes to the tired old school that inspects for quality *after* the process is finished. That approach doesn't work when building cars, and it certainly doesn't work in forensic laboratories. Instead, the forensic community is properly emphasizing quality standards at every key stage of forensic analysis. Laboratory accreditation programs specify academic qualifications for forensic scientists and require rigorous training programs. Laboratory procedures for each category of examination must be documented and are subject to review by courts and defense counsel. Such procedures include internal checks for quality control. Reported results are subject to confirmation and also to supervisory review. Finally, forensic laboratories participate in proficiency testing to provide periodic assurance that analytic systems and procedures are in place and working properly. One can see that while proficiency testing is a necessary part of assuring quality, it is hardly sufficient in itself.

One final comment: the article cites regulatory schemes designed for commercial clinical laboratories as a model for forensic laboratories. It fails to recognize an important distinction, however. Crime laboratories are government, not commercial activities. They are typically adjunct to a law enforcement agency and therefore subject to public oversight. Virtually every probative test result from a crime laboratory is subject to exhaustive scrutiny in the courts. In more than two-thirds of the cases in which FBI experts have offered DNA evidence, for example, there have been extensive pre-trial reviews, some lasting for several months before their evidence was admitted in court. In contrast, commercial clinical laboratories are profit-driven enterprises subject to minimal outside scrutiny and their results are typically seen only by the physician who requested the tests. While formal regulation may have been warranted for the commercial clinical laboratories, it is not clear the same is

appropriate for public crime laboratories, especially in light of voluntary measures adopted within the forensic community. Public funds are better used to support research and training to enhance the quality of forensic services rather than to strap on additional administrative layers.

John W. Hicks
Assistant Director in Charge
Laboratory Division
Federal Bureau of Investigation
Washington, D.C.

* *

I am an attorney licensed to practice in the State of Washington. I have been in practice since 1976. My practice is limited to representing persons charged with felonies in state and federal courts. I read Professor Jonakait's Article which appeared in your Spring issue. Based on my experience, I agree that the present state of forensic science in this country is deplorable.

I recently tried a death penalty case in Kitsap County, which is located on the west side of Puget Sound across from Seattle. My client, a thirty-three year old black male, was charged with the premeditated beating murder of a twelve year old white girl during the course of an attempted rape. The girl was killed in a wooded area adjoining a golf course where she had gone for a walk prior to dinner. The government's case against my client consisted in large part of forensic analysis of bloodstains discovered on a pair of his dress shoes and shoelaces. The bloodstained shoelaces were first examined by a forensic analyst in the Washington State Patrol Crime Laboratory in Seattle. After determining that the bloodstains were of human origin, he conducted two tests: an ABO test using absorption elution and a Gamma Marker test using the Wraxall slide method. He typed the bloodstains as ABO type O and gamma marker type 1, 2, 3, 11. These results excluded the defendant as the donor but included the victim as a possible donor. Specifically, 44.5% of the population shared her ABO type and 14% shared her gamma marker type.

However, upon reviewing his benchnotes, I learned that when the analyst initially tested the shoelaces he obtained indications of both type A and type O blood. The victim's blood was type O while the defendant's was type AB. He retested the blood and again obtained indications of both types although the reaction for type O was much stronger. He reported the result as type O for one shoelace and inconclusive as to the other. He was not aware that there are rare variations of type A which will test positive for the presence of both A and O blood.

As a result, he mistakenly reported the result. Since the victim's blood type is O, the correct result excludes her as the donor.

We obtained copies of the same analyst's performance in a voluntary proficiency test administered by the National Collaborative Testing Service. This particular test was developed as a result of the celebrated dingo case in Australia where a mother was mistakenly convicted of killing her infant even though she claimed he had been attacked by a dingo. The test was designed to see if the analyst could correctly identify foetal blood and if he or she could further determine whether the blood came from more than one source. The analyst in our case was unable to correctly solve either problem.

The gamma marker test was also flawed. It utilized a test procedure developed by Brian Wraxall at SERI Lab in California. This procedure is called the slide method. All gamma marker testing is an absorption inhibition test (i.e., it tests for the absence of visible agglutination). Wraxall's method involves rotating a sample slowly on a microscope slide and looking to see if agglutination has or has not occurred. This method has been characterized in testimony by Dr. Moses Schanfield (generally considered to be the most experienced and knowledgeable person in the country on gamma marker testing), as the "Humpty Dumpty" method. This is because the chemical reaction is very weak and, unlike any other method of testing, it easily comes apart and cannot be put back together again. Unlike Dr. Schanfield, Wraxall does not photograph his results so we must rely on his word for what he observed. No other laboratory in this country with the exception of SERI uses the method and even the Washington State Patrol Crime Laboratory has stopped using it. Several other laboratories tried using it but gave it up because they could not make it work.

The shoelaces were then sent to Dr. Edward T. Blake at Forensic Science Associates in Richmond, California. Dr. Blake's specialty is DNA — PCR testing using the CETUS HLA-DQ kit. He identified the genotype of the bloodstain as a 1.2, 3. This result excluded the defendant as the donor but matched the victim's type. Specifically, her type is common to eight percent of the population.

Dr. Blake's PCR analysis of the shoelaces was typical of the work performed in this case. When he first tested the shoelaces, he was unable to obtain a result. He attributed his failure to the presence of heme in the bloodstains which he believed impeded the test although he conducted no experiment to verify his theory. He conducted a second test months later and obtained results, however, he also obtained results on his environmental controls. Environmental controls are used in scientific experiments to determine if the results one is obtaining in testing the questioned sample truly reflect the sample or the environment on which

the sample may be located. In this case, Dr. Blake tested a portion of the bloodstain and a portion of adjacent shoelace material. Ideally, no result should be obtained in the environmental control test particularly where, as here, the test detected DQα alleles, which are found only in human DNA. Yet, he obtained one. Obviously, his test was flawed by contamination and no result should have been reported. Nevertheless, he reported the result he obtained on the bloodstain and testified that he was comfortable with his conclusions. At the time he did the testing, his lab was the only one in the United States doing it. He noted in his report that all of the testing performed by his laboratory had been done in collaboration with Dr. Henry Erlich and his colleagues at CETUS Corporation where PCR testing and the DQα kit were developed. He admitted on cross examination, however, that no one from CETUS oversaw any portion of the testing or reviewed any of his data contained in his benchnotes. He did not repeat the test to see if the results could be duplicated. Reproducibility of results is essential to good science. His subjective interpretation of his results reading through and ignoring contamination is scientifically indefensible.

Dr. Blake also referred the shoelaces to his friend and associate in the lab next door, the previously mentioned Brian Wraxall. He performed a haptoglobin ("Hp") test which is a standard protein identification test using an acrylamide gel. Haptoglobin is a protein which is genetically variable. It disposes of old hemoglobin in the blood. Wraxall typed the bloodstain as a type 2–2. This excluded the defendant as the donor but was consistent with the victim's type. Specifically, 36.1% of the population shares this type.

This test was also flawed. Haptoglobin tests are conducted using electrophoretic gels. The band(s) migrate toward the gel under the influence of an electrical current, a stain is added to show the location of the band and then the evidentiary sample is compared to known samples run on the same gel (positive controls) to see if there is a match. In our case, the haptoglobin bands present on the electrophoretic gel from the evidentiary samples did not match the standards. Wraxall made a subjective call based on his "skill and experience" reasoning that the shoelace sample was more like the victim's sample than the defendant's....

The prosecution applied the product rule multiplying each of the percentages with each other resulting in a determination that the blood on the shoelaces came from the victim or someone else in a population pool sharing the same types consisting of .18% of the population or one in every 555 people in the county where the victim was murdered (44.5% × 14% × 8% × 36.1% = .18%).

As you might well imagine, these results initially caused me to believe that there was a very strong probability that someone wearing the

defendant's shoes had murdered the girl. According to witnesses who lived with the defendant, only he wore those shoes. Therefore, I felt there was little chance of challenging the state's case successfully on the identity issue (i.e., who killed the victim). My cocounsel agreed with me and we were within an eyelash of conceding the identity issue even though our client denied guilt. Our investigation and the assistance provided to us by our consulting expert, Dr. Benjamin W. Grunbaum of Moraga, California, convinced us otherwise.

I wish I could report that the case ended favorably with the acquittal of our client. Unfortunately, I cannot. Although we presented the testimony of several extremely well qualified and knowledgeable scientists, the jury elected to believe the government's forensic "scientists." They simply refused to believe that they could be so ignorant and wrong. In other words, they accorded them a presumption of correctness. They discounted our experts as mere academics with their "heads up in the clouds."

The client was sentenced to death. Words alone cannot communicate the feeling of despair that swept over me, my cocounsel and the client when we heard the verdict and learned why the jury discounted our evidence. I can only say that in my experience forensic scientists are analysts, not scientists. They are accorded a presumption of correctness even though there is no basis for it. And, now they want to do DNA testing which is more complicated to perform than the routine forensic testing they so miserably butchered in the LEAA and Collaborative Testing Service proficiency tests.

I completely agree with Professor Jonakait. We have a severe problem on our hands.

Frederick D. Leatherman, Jr.
Attorney at Law
Seattle, Washington

* *

Despite Professor Jonakait's obviously low opinion of the forensic science profession, he and I agree on several important points: 1) quality and competence should be essential attributes of the forensic scientist, and 2) when these attributes are not present, the quality of justice suffers.

In the last few years, the quest for quality has become a national agenda. There is growing dissatisfaction with the quality of our products, our medical care, our legal system, our education, and, of course, our governmental services. Forensic science is a part of our system of justice, and as such, fully deserves open scrutiny. The problem with

Prof. Jonakait's paper is that it is not a balanced study of the quality of work in forensic science; it is an argument supporting the hypothesis: forensic scientists are incompetent and something should be done about it.

There is no question that the 1978 Proficiency Study suggested some serious problems. This study was designed as an experiment to determine the feasibility of proficiency testing in crime laboratories. However, even allowing for some poorly designed questions, debatable interpretations of the answers to these questions, and assuming 100% accuracy in the collation of the results, there was still considerable reason for concern. Faced with this problem, we voluntarily continued this program in an attempt to address quality issues within our profession. The results of our current proficiency tests show marked improvement and indicate error levels comparable with accuracy studies of clinical labs. Ten years ago, the American Society of Crime Laboratory Directors ("ASCLD") formed a crime laboratory accreditation board-ASCLD/LAB to establish standards of quality for the operation of crime laboratories. An essential requirement of that program is external proficiency testing for all analysts. At present, ASCLD/LAB has accredited approximately ninety laboratories in the U.S. and the number of applicants is increasing every year. Last year ASCLD/LAB resolved to establish a special accreditation for DNA laboratories. This program will require satisfactory performance by all laboratory analysts on open, external proficiency tests as a condition of maintaining their accreditation. This year ASCLD resolved to support open, mandatory proficiency testing for all forensic disciplines. A relatively new organization, the American Board of Criminalistics ("ABC"), is beginning to offer certification of individual analysts.

I mention these facts to illustrate that there is a sincere and abiding commitment to quality within the forensic science community. This commitment often requires a degree of openness that inevitably leaves us vulnerable to the type of criticism leveled by Prof. Jonakait, but in the end we believe it increases both the quality and credibility of our profession.

One of the most disturbing parts of Prof. Jonakait's Article is his dismal assessment of the legal community and its commitment and competence to insure the quality of forensic evidence presented to it. He presents us with a paradox. First, he asks us to accept his analysis of the quality of work being done in forensic science and in the next breath argues that the legal community is incapable of such analyses. He can't have it both ways.

Personally, I believe that the courts are entirely competent to assess the quality of forensic work presented to them if they are provided a suit-

able yardstick. That yardstick already exists in the form of the CTS Proficiency Program. Contrary to the impression given in Dr. Jonakait's Article, the results of these tests are available to the courts. They simply have to ask for them. Anytime an analyst testifies, he can and should be asked whether or not he participates in a proficiency testing program. If he does, then he can be asked to produce a record of his results on these tests. Furthermore, he can be asked if his lab is accredited by ASCLD/LAB and if not, why not. I believe that the courts get the quality that they demand. Unfortunately, to date, they have demonstrated little interest in the quality assurance measures that we have already set in place.

After all this, it may surprise you to know that I agree, for the most part, with Prof. Jonakait's final solution. Forensic analysts should be required to undergo periodic proficiency testing and these results should be readily available to the courts. In fact, this is already the case in many laboratories and we are working to make it a profession-wide phenomenon. My only regret is that apparently Dr. Jonakait's lack of current information impelled him to assail an entire profession, not only in his Article, but in the national news media as well.

I am very proud of the progress made by forensic science in the area of quality assurance. While there were certainly some "outside" stimuli, it is to our credit, I believe, that we responded promptly and substantively to these issues, and will continue to do so in the future.

Richard L. Tanton
Immediate Past President,
American Society of Crime
Laboratory Directors;
Director, Palm Beach County
Sheriff's Office Crime Lab
West Palm Beach, Florida

* *

AUTHOR'S REPLY

My Article contended that first, forensic science is important.

Second, little is known about the quality of forensic science laboratories. Few available studies have explored how well crime labs perform.

Third, the existing studies consistently reveal huge problems. Proficiency testing, which is the best measure of quality, has unfailingly shown that the labs perform poorly. Older studies demonstrated per-

vasive quality problems, and all the available recent proficiency testing data indicate that the abysmal performances of forensic laboratories continue.

Fourth, poor forensic science quality can be expected because of the inadequate education and training of many forensic scientists; because of the small amount of good forensic science research; because of the absence of rigorous quality control measures; because of the lack of significant peer review; and because forensic scientists have tried, mostly successfully, to prevent collection and dissemination of information about their labs.

Fifth, we need to improve forensic science laboratories. Regulation has improved clinical laboratory quality, and similar regulation should improve the performances of forensic science laboratories.

Sixth, at a minimum, all forensic science laboratories should undergo blind proficiency testing to enable those who fund and use the products of these labs to know how well forensic scientists perform and perhaps because this testing might spur labs on to better quality.

The key to this analysis is that we do not know enough about the quality of forensic science laboratories, but what we do know indicates that the quality is bad. Both Professor Carol Henderson Garcia and Mr. John W. Hicks of the FBI labs attack my Article. They assert that I refer to outdated material and do not recognize that forensic science is now better than it once was. Mr. Hicks contends, "The Article failed to acknowledge developments during the last decade which have galvanized the forensic community and contributed significantly to ensuring the quality of work performed in crime laboratories." Professor Garcia takes the same tack: "Unfortunately, Professor Jonakait's Article ignores the strides that have been made in the recent past to improve the laboratories and quality of forensic science."

These responses ignore the discussions in my Article of the results of proficiency testing done in the last decade (pp. 116–24). These recent tests in diverse areas of forensic science consistently disclose shoddy lab work. Garcia and Hicks simply close their eyes to the available data which demonstrates that "[t]he most thorough of the [proficiency] tests . . . showed abysmal performances, and all subsequent testing indicates that problems persist." (pp. 123–24). This conclusion is further buttressed by the specific examples supplied in the letters of Mr. Lonnie C. Simmons and Mr. Frederick D. Leatherman, Jr. as well as from other sources. *See, e.g.*, Paul C. Giannelli, *Criminal Discovery, Scientific Evidence and DNA*, 44 *Vanderbilt Law Review* 791, 818 (1991) ("In 1989 an experienced firearms identification expert made an erroneous positive identification in a murder case. The error marked the third reported mistake by the Los Angeles Police Department crime laboratory.").

Most telling in the responses of Garcia and Hicks, however, is the fact that their assertions of good performances are completely unsupported by citations to any studies or other data. Apparently we should believe that forensic laboratories now do well because they say so. Perhaps they are right, but a debate over an empirical science should be settled by scientific data, not by unsubstantiated assertions. Proof of the quality of forensic science requires replicable, published studies showing quality performances. That proof is not present. Apparently it does not exist.

Forensic laboratories cannot know how well they perform unless they undergo good proficiency testing. The rest of us cannot assess that quality unless the results of such proficiency testing are made public. The failure of Garcia and Hicks to cite any data to support their allegations only confirms the crucial conclusion: The available information indicates widespread, shockingly poor performances by forensic laboratories.

Indeed, as Mr. Hicks is aware, the FBI does not want more public information about the quality of its laboratories. Although the FBI claims to do meaningful proficiency testing, it consistently fights to keep the results of those tests hidden. *See, e.g., United States v. Sanchez*, 932 F.2d 964 (4th Cir. 1991) (unpublished, WESTLAW, ALLFEDS Database) where the FBI prevented the defendants from seeing the FBI's DNA proficiency testing successfully contending, "Confidentiality is essential to ensure a candid review and critique of that particular examiner's performance." If the FBI had its way, the disinfectant of strong sunlight would be kept away from the FBI labs. Why? If there is nothing to be hidden, why does the FBI fight so hard to hide the information about its lab quality?

Mr. Hicks and I, however, are not in complete disagreement. He concludes that "while proficiency testing is a necessary part of assuring quality, it is hardly sufficient in itself." My contention precisely. I advocated not just proficiency testing but a comprehensive program including the maintenance of a quality control program; the maintenance of proper records; and the requirement of personnel standards in addition to thorough, blind proficiency testing and unannounced on-site inspections (pp. 178–80). I went on to conclude that since no data indicate that these requisites to quality are consistently done by all, or even most, criminal labs, regulation is necessary to assure they will be carried out. Mr. Hicks, with no data to support his position, apparently believes we should just trust in the goodwill of the labs.

Mr. Hicks goes on to conclude that the clinical laboratory model fails because those regulations were designed for commercial labs, and "[c]rime laboratories are government, not commercial activities." The clinical regulation in many of the states and by the federal government,

however, is not limited to commercial activities, as Mr. Hicks mistakenly asserts, but applies to nonprofit and government labs as well. Furthermore, Mr. Hicks ignores the fact that some aspects of forensic laboratories are already regulated. Thus, as the Article notes, the federal government regulates labs doing federally-mandated employment drug-testing (p. 177). Even more to the point, many states closely regulate forensic tests for determining blood alcohol levels with requirements of certification and proficiency testing for those performing the tests. *See, e.g., State v. Benoit*, 570 S.W.2d 490 (La. Ct. of App. 1990) (discussing one state's regulation of those who test for blood alcohol levels). In spite of Mr. Hicks' assertions, experience has demonstrated that labs performing forensic tests can be regulated. The fact that many forensic laboratories are government facilities tells us nothing about whether they should be regulated.

Professor Garcia responds to my contention that forensic laboratories are supported by little good research by noting that "the National Institute of Justice has expended 1.3 million dollars in forensic science research in the last year." That number needs to be put in perspective. For example, universities alone received more than nine billion dollars from the federal government last year. Just one institution, Stanford, received 240 million dollars from the federal government for scientific research during that time. *See* Leonard Curry, *Stanford Fallout, San Francisco Chronicle*, Mar. 16, 1991, at A1. My discussions with a university researcher indicate that 1.3 million dollars would support eight to ten researcher, their equipment and supplies, required technicians, and overhead for only a year assuming the principal investigators had other sources for their salaries and might only fund five researchers if the grants had to finance the scientists fully. That is not much research.

Professor Garcia refers to publications in the *Journal of Forensic Sciences*. Let me counter with different information. The most prestigious scientific journal in this country is probably *Science*. My perusal of the last six months of *Science* reveals articles about almost every scientific area, but no published research about any of the myriad branches of forensic science except for DNA typing. American forensic science is simply not part of mainstream science.

Professor Garcia and Richard L. Tanton of the American Society of Crime Laboratory Directors both point out the recent trend towards voluntary certifications of laboratories. This does give some hope for improved forensic science, but that hope must be tempered. As my Article discusses (p. 130), "certification can be meaningful only if it has important consequences." So far, nothing important depends on the presence or absence of certification. Forensic science labs do not have to

be accredited to have their employees perform tests or give court testimony, and as Mr. Leatherman's letter indicates, failure to perform well on proficiency tests does not normally bar the forensic scientist from doing analyses or testifying. (The only case I have found where an analyst was prevented from testifying because of poor proficiency test performances is *State v. Madsen*, 772 S.W.2d 656 (Mo. 1989), where the accused was prevented from calling a police forensic scientist to present exculpatory testimony.). So far, nothing has been presented to show that such voluntary programs truly improve quality. As the laboratory director I quoted in my Article said (p. 174), "Most of us would prefer that regulation be on a voluntary basis. But, frankly, voluntary systems don't work worth a damn in the long run."

The ASCLD certification programs, however, because they include proficiency testing can be valuable. Mr. Tanton indicates that "[f]orensic science is a part of our system of justice, and as such, fully deserves open scrutiny." This belief should compel the ASCLD to make public the results of that testing. On the other hand, although Mr. Tanton asserts that the "results of our current proficiency tests show marked improvements and indicate error levels comparable with accuracy studies of clinical labs," so far these results have not been published. Their publication would be an important aid in assessing the present quality of forensic laboratories.

In any event, even if the tests were made public and supported the assertion, we should interpret the results carefully. First, only about a quarter of forensic labs have sought voluntary ASCLD accreditation and these are probably the laboratories most concerned with quality. As my Article notes, poorer labs do not participate in voluntary programs (pp. 114–15, n.20).

Second, Mr. Tanton refers to "open, external proficiency tests." Although he does not define "open," I presume that he means those being tested know that they are being tested. As my Article showed, however: "Studies indicate that performance will be better on known examinations than on either blind tests or real casework. To learn about the accuracy and reliability of lab work, forensic facilities must be subjected to blind testing that simulates real cases as much as possible." (p. 185).

Mr. Tanton also maintains that courts do have access to the proficiency tests done by the Collaborative Testing Services ("CTS") (CTS apparently does not test the FBI labs, which claim to test themselves. As noted above, the FBI routinely fights disclosure of these tests.). As Mr. Leatherman's letter indicates, CTS reports do sometimes get disclosed, but such disclosure is still too often the exception. As Paul C. Giannelli's *Criminal Discovery, Scientific Evidence, and DNA*, 44

Vanderbilt Law Review 791 (1991) demonstrates, many courts, for reasons that make little sense, limit discovery of scientific data.

Even so, attorneys in every case involving forensic science should be seeking these proficiency reports. They should be asking for the testing done of the person who did the analysis to see how well the expert involved performs, of the particular lab generally for information about that lab's overall quality, and for tests nationwide concerning the particular analysis for information about how accurate the testing really is. In my Article (pp. 185–90), I discuss the various ways disclosure of proficiency testing reports can aid the criminal justice system.

Finally, especially since the forensic science community is not rushing to let the public know how well it performs, an attorney obtaining proficiency testing results or other data about crime lab quality should disseminate that information. The more that is known about forensic sciences laboratories the more likely this aspect of criminal justice will be improved.

Randolph N. Jonakait
Professor of Law
New York Law School
New York, New York